

MAY 2025

TARRANT COUNTY ESD 1, TX

SUMMARY REPORT





Executive Summary

Tarrant County Emergency Services District 1 (District) has experienced significant population growth and a corresponding increase in calls for service. However, with funding limited to property taxes and a public policy focusing on low tax rates, the District has been challenged to maintain service levels.

Further, as more citizens move into the service area, often into sizable single-family homes, public infrastructure for community water and fire hydrants has not kept pace with neighboring urban and suburban communities. The District inherited public policy land-use choices that permitted large structures without adequate community water infrastructure and Fire Code decisions that did not require residential fire sprinklers. Insurance companies have recognized this situation, noting they cannot insure some homes and charge high policy rates commensurate with their calculated loss risk on the ones they can insure.

The District Board of Commissioners, its contracted staff, and fire and EMS agencies holding service contracts should be commended for their dedication to the community and its citizens. They have worked diligently to meet growing needs with limited resources. Fire and EMS staff should especially be acknowledged for demonstrating impactful mutual aid and cooperation.

The Board understands the challenges of a growing population, calls for service, and external threats to the District. In 2023, they authorized Tarrant County Emergency Services District No. 1 Proposition A, a sales and use tax, to be placed on the ballot for voter approval. The proposition authorized the District to collect up to two percent (2%) in all areas not yet at the state maximum of 8.25%. The voter-approved measure passed, and the District has begun to collect this new revenue.

The District retained *FITCH* to evaluate and recommend strategic options for this new revenue and to examine the current fire and EMS performance in the District.

Evaluations and recommendations in this study include a strategic planning and recommendation framework to provide the District with a path forward, particularly regarding the best use of new revenue and whether it should hire its own fire and EMS staff or continue to contract for services.

Finally, a comprehensive assessment of District fire and EMS service delivery using an objective, data-driven process was completed.

Key Priorities

1. Adopt a reserve fund policy for 25% of revenue.
2. Address challenges with ISO and insurance coverage for citizens.
 1. Build three new stations in the following priority order: Eagle Mountain, Whiskey Flats, Lake Worth.
 2. Staff a 3-person engine at Eagle Mountain and Whiskey Flats 24/7.
 3. Staff select tankers with a FF/EMT 24/7.
3. Fund 100% of the EMS program with a total of nine ambulances.
 1. Assume billing responsibility with an estimated cost recovery of \$1m plus ASPP.
4. Improve Turnout Time and Total Response Time
5. Utilize performance-based contracts for greater operational and fiscal accountability and transparency.



Background and Legal Authority

Tarrant County Emergency Services District 1 (District) was established on August 20, 1996, after an election to convert the Tarrant County Rural Fire District into an emergency services District. The District provides fire, rescue, emergency medical, and ambulance transportation services (EMS) in Tarrant County's unincorporated areas. The District serves a growing population of approximately 55,000 citizens and 25,000 structures across 183 square miles of unincorporated Tarrant County.



The District must ensure reliable emergency response in rural or underserved areas that might otherwise lack resources. Although it does not employ its own fire and EMS staff, it has agreements with 26 municipal and volunteer fire departments to fulfill its emergency response responsibilities. The District contracts with Tarrant County Government to provide administrative services and an office facility. It also utilizes professional services agreements for administrative support, budgeting, and fiscal needs.

The Texas Health and Safety Code, Chapter 775, was created by the State of Texas Legislature in 1989 and has been amended many times. Chapter 775 governs emergency services districts (ESDs). An ESD is a voter-approved special taxing District that provides fire protection, emergency medical services (EMS), or both to residents in areas where local governments (such as cities or counties) may not provide adequate emergency services. ESDs are specialized local government political subdivisions like school districts or municipal utility districts.

The Tarrant County Commissioners Court, by consensus, appoints the District's Board of Commissioners (Board). The County Judge has appointment authority to countywide boards and commissions and, under Texas law, Emergency Management Authority over the entire county.

The District has a five-member board that oversees the District's operations and business. By law, the Board must meet monthly in an open public meeting to conduct the business of the District. The Board is responsible for:

1. **General Governance and Oversight:** Ensure effective emergency services, adopt policies, comply with the law, and conduct meetings in accordance with the Texas Open Meetings Act.
2. **Financial Management and Budgeting:** The Board develops and approves the annual budget, sets the tax rate, and provides financial oversight, including annual audits. The Board must file annual audits with the County by June 1 of each year.
3. **Contracts and Service Agreements:** Establish and monitor fire and EMS services contracts and negotiate agreements with cities, counties, or other ESDs to coordinate service areas and funding.
4. **Personnel and Administration:** Appoint and supervise key personnel, including the Fire Chief or District Executive, set compensation and benefits, establish training requirements, and ensure emergency staff receive proper training and certification.
5. **Public Transparency and Compliance:** Hold public hearings to ensure transparency on budget adoption, set the tax rate, annual audits, contract compliance, submit legally required reports, and implement significant operational changes.
6. **Emergency Planning and Response Coordination:** Develop emergency response plans for natural disasters, mass casualty events, or other crises, and coordinate with regional and state agencies.

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Stakeholder Input

Stakeholders were provided the opportunity to meet with the *FITCH* team between August 27, 2024 and November 7, 2024. In total, 15 interviews were conducted with fire chiefs, deputy and assistant fire chiefs, and the interim ESD1 Executive Director. *FITCH* contacted all fire, EMS, and mutual-aid providers after obtaining the agency contact list from ESD1 staff. Each interview lasted 45-60 minutes. Interviews were conducted with the following agencies:

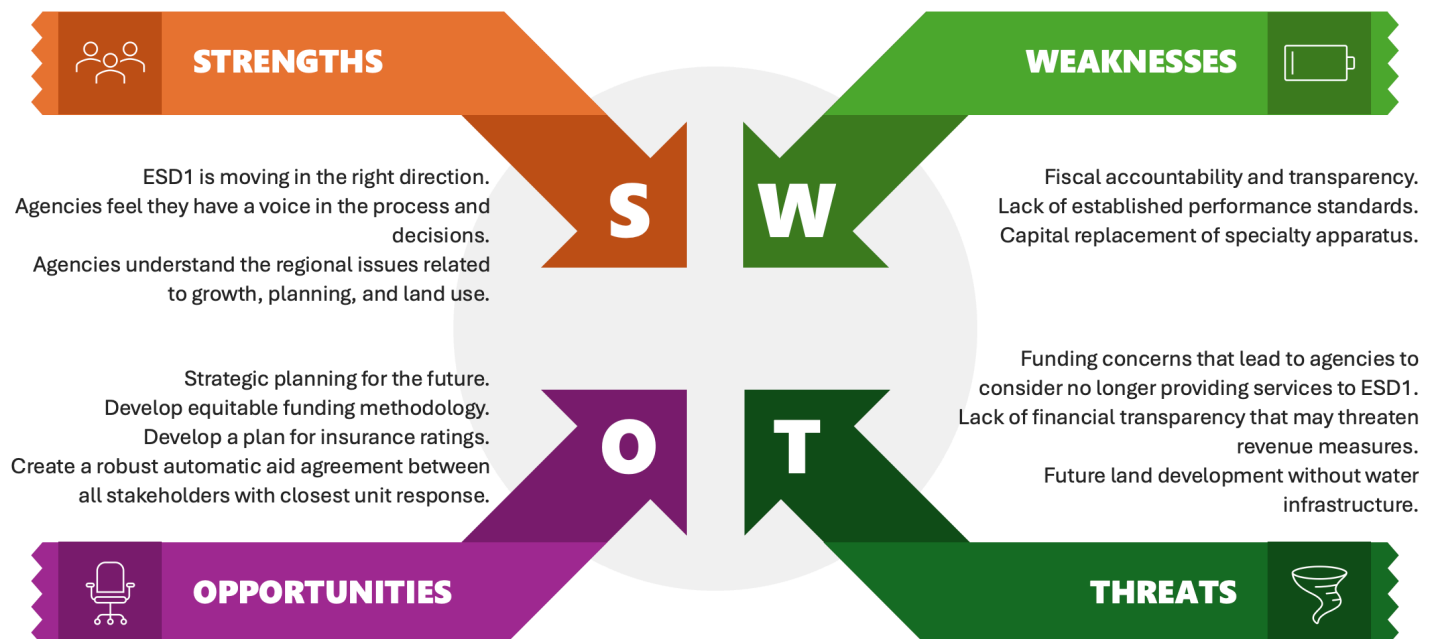
Azle Fire Department	Benbrook Fire Department	Blue Mound Fire Department	Briar-Reno Volunteer Fire Department
Cresson Volunteer Fire Department	Crowley Fire Department	Eagle Mountain Volunteer Fire Department	Everman Fire Department
Haslet Fire Department	Lake Worth Fire Department	Newark Volunteer Fire Department	Rendon Volunteer Fire Department
Saginaw Fire Department	White Settlement Fire Department	Tarrant County ESD1	

Observations

In total 14 agencies and ESD1 provided stakeholder input for this process.

The SWOT analysis below is an anonymous summary of key themes.

Fitch used various techniques to gather feedback, including one-on-one, small group, virtual interviews, document review, and financial analysis. The interviews aimed to gather information and perspectives from fire agency staff and others who supported the fire and EMS agencies. Questions were used to solicit background, subjective and objective observations, ideas for efficiencies, and methodologies for distributing current and new revenue to improve fire and EMS services across ESD1.



Reserve Fund Analyses

If ESD1 follows the reserve funding recommendations, particularly for the facilities reserve, the reserve fund will increase to over \$25 million in FY2025/26. The reserve fund will be spent down to approximately \$11 million by FY 2028/29, which covers the start-up capital costs of three fire stations and new fire and ambulance apparatus. After the one-time reserve balance adjustments for the fire stations and fleet combined with the multi-year start-up expenditures, the recommended annual facility replacement contribution is \$414,254, and the fire and ambulance fleet replacement is \$782,158 for a yearly total of \$1,196,412.

In FY 2025/26, the budget projects that the Fire Equipment Capital Fund will purchase one Type 1 Engine, one 3000-gallon Water Tanker, one Type 4 Brush Engine, and one utility pickup. The Ambulance Capital Fund will purchase three ambulances. The Facilities Capital Fund is expected to begin paying for land acquisition, architectural design, and engineering for fire station construction. \$1,529,087, or ten percent (10%) of the total facilities fund of \$15.9 million, is estimated to be spent.

Observations

The reserve fund is well managed and the District has a long-standing policy of not incurring debt.

The reserve fund is to fund at 25% of revenue.



In FY 2026/27, the projected fire equipment and ambulance capital costs are the same as those for FY 2025/26. As the first fire station is completed, the Facilities Capital Fund is expected to begin paying one-third (1/3) of its estimated total construction costs, or approximately \$4,587,260.

FY 2027/28 is similar to FY 2026/27, as the new fleet has been completed, and the payment for the second fire station has been made.

In FY 2028/29, the annual fleet and facility replacement funds return to the yearly amount of \$1,196,412, once the last fire station construction expenditure is made and the start-up fleet and facility capital programs are completed.

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Reserve Fund Projections

RECOMMENDED RESERVE FUND FOR 2025/26

General Fund Operating	\$ 2,048,761	10% of Current Revenue
Texpool General Fund Reserve	3,073,141	15% of Current Revenue
Texpool Fire Equipment Capital Fund	3,313,943	Cost of 1 of each apparatus type + 6 yrs replacement
Texpool Ambulance Capital Fund	1,330,808	Cost of 3 Amb + 10 years of replacement
Texpool Facilities Capital Fund	15,290,868	Land & Construction Costs for 3 Stations
TOTAL	\$ 25,057,522	

RECOMMENDED RESERVE FUND FOR 2026/27

General Fund Operating	\$ 2,043,915	10% of Current Revenue
Texpool General Fund Reserve	3,065,872	15% of Current Revenue
Texpool Fire Equipment Capital Fund	3,295,802	Cost of 1 of each apparatus type + 6 yrs replacement
Texpool Ambulance Capital Fund	1,505,051	Cost of 3 Amb + 10 years of replacement
Texpool Facilities Capital Fund	9,588,775	Land purchase, architecture, design, engineering
TOTAL	\$ 19,499,414	

RECOMMENDED RESERVE FUND FOR 2027/28

General Fund Operating	\$ 2,049,372	10% of Current Revenue
Texpool General Fund Reserve	3,074,057	15% of Current Revenue
Texpool Fire Equipment Capital Fund	3,377,660	Cost of 1 of each apparatus type + 6 yrs replacement
Texpool Ambulance Capital Fund	1,679,293	Cost of 3 Amb + 10 years of replacement
Texpool Facilities Capital Fund	5,415,769	Construction on 2 of 3 stations
TOTAL	\$ 15,596,151	

RECOMMENDED RESERVE FUND FOR 2028/29

General Fund Operating	\$ 2,040,138	10% of Current Revenue
Texpool General Fund Reserve	3,060,207	15% of Current Revenue
Texpool Fire Equipment Capital Fund	3,100,575	Cost of 1 of each apparatus type + 6 yrs replacement
Texpool Ambulance Capital Fund	1,603,536	Cost of 3 Amb + 10 years of replacement
Texpool Facilities Capital Fund	1,242,763	Construction Complete
TOTAL	\$ 11,047,218	

Budget Projections 2025-2029

Analysis of the budget projections through Fiscal Year 2028/29 shows stable revenue of approximately \$20.5 million annually. Property tax revenue is estimated to increase by two percent (2%) annually. A conservative approach to estimating future Sales & Use Tax revenue assumes no increase (0%) from Fiscal year 2025/26 to 2028/29. The Sales & Use Tax remains at the current annual projection of \$10.75 million annually. The Texpool interest revenue will increase for two years as the District's reserve funds increase, then decrease as the fire station facilities are completed and the newly added fleet is delivered. A conservative four percent (4%) interest rate projects interest revenue. The rates have been significantly higher, but there will likely be continued financial market uncertainty in the foreseeable future.

Observations

Sufficient annual revenue is available for several staffing alternatives as well as hiring some District employees for executive and administrative positions.

Expenditures for each line item are assumed to increase at five percent (5%) or higher. For this analysis, it is assumed that there has been no strategic change to fire and ambulance services and the aid to department staffing funds. Tarrant County personnel costs decrease as the ESD1 executive director and administrative staff begin. Insurance costs increase as the new fleet and facilities are acquired.

After the reserve fund reallocations and significant capital expenditures, the total annual budget is projected to end under budget in a range between \$4.6 million in FY 2025/26 to \$8.3 million in FY 2028/29 through reserve reallocation and significant capital expenditures. The commissioners should consider this revenue range when determining staffing options and costs.



Sufficient annual revenue is available for several staffing options where ESD1 could employ some operational and administrative staff. If the Aid to Departments-Staffing Fund is strategically reallocated, up to an additional \$3.25 million will be available for ESD1 staffing options.

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Budget Projections 2025-2029

	Estimated 2025/26	Estimated 2026/27	Estimated 2027/28	Estimated 2028/29
REVENUE				
Property Tax	\$ 7,576,917	\$ 7,728,455	\$ 7,883,024	\$ 8,040,685
Sales & Use Tax	10,750,000	10,750,000	10,750,000	10,750,000
Interest Income	800,000	600,000	500,000	250,000
Operating Fund Balance	1,360,692	1,360,692	1,360,692	1,360,692
Total Current Revenue	\$ 20,487,609	\$ 20,439,147	\$ 20,493,716	\$ 20,401,377
ARPA - Reimbursements				
ARPA - Indirect Cost				
Sale of Fire Equipment	40,000	40,000	40,000	40,000
Use of Fire Equipment				
Use of Fire Equipment Reserve	1,970,000	1,970,000	1,920,000	885,000
Use of Ambulance Grants Reserve	750,000	750,000	750,000	250,000
Use of Facilities Reserve	1,529,087	4,587,260	4,587,260	4,587,260
Total Revenue/Grants	\$ 24,776,696	\$ 27,786,408	\$ 27,790,977	\$ 26,163,637
EXPENDITURES				
Service Contracts				
Fire Service	\$ 2,518,551	\$ 2,644,479	\$ 2,776,702	\$ 2,915,538
Ambulance Service	2,887,500	3,031,875	3,183,469	3,342,642
Aid to Departments-Staffing	3,250,000	3,250,000	3,250,000	3,250,000
TC Regional Communications	476,280	500,094	525,099	551,354
Tarrant Appraisal District	43,000	43,500	44,000	44,000
Tarrant County - Personnel	25,000	25,000	25,000	25,000
Director & Admin Staff	270,250	339,000	407,750	407,750
Insurance and Bonds	45,000	55,000	85,000	85,000
Equipment Maintenance	150,000	150,000	150,000	150,000
Professional Services	100,000	100,000	100,000	100,000
Misc. Operating Expenses	100,000	100,000	100,000	100,000
Capital	3,749,087	7,316,956	7,316,956	5,416,258
Grants to Departments	375,000	400,000	450,000	475,000
Total Expenditures	\$ 13,989,668	\$ 17,955,903	\$ 18,413,976	\$ 16,862,542
Allocation to Fire Reserve				
APRA - Disbursements				
Sale of Fire Equipment				
Allocation to Operating Reserve	(1,100,501)	-	-	-
Allocation to Facilities Reserve	7,290,868	414,254	414,254	414,254
Allocation to Fire Equipment Reserve	1,951,858	1,951,858	2,001,858	607,915
Allocation to Ambulance Grants Reserve	(2,022,881)	924,243	924,243	174,243
Total Expenditures/Transfers/Grants	\$ 20,109,013	\$ 21,246,259	\$ 21,754,331	\$ 18,058,954
(Over)/Under Budget	\$ 4,667,683	\$ 6,540,149	\$ 6,036,646	\$ 8,104,684

Funds not fully assigned to programs available for strategic staffing decisions are highlighted.

Funds from existing programs available for strategic staffing decisions are highlighted.

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Assessment of Mobile Apparatus Needs

A blended approach to funding equipment within ESD1 has been employed. For example, until recently all ambulances were purchased and owned by the individual municipalities or fire departments. Similarly, the fire engines and aerial apparatus are owned by the local agencies. However, ESD1 has provided Tankers to nine agencies and brush trucks to seven agencies. These units are owned by ESD1, but staffed and operated by the local agency.

Records would indicate that four brush trucks should have been replaced in 2023, one tanker in 2024, and one additional tanker in 2026. The remaining equipment owned by ESD1 are due for replacement between 2028 and 2032. Therefore, due to industry delays in receiving apparatus, the District is encouraged to monitor the build time from the manufacturers and adjust the schedules accordingly.

Observations

The capital replacement fund is well funded and the District is ensuring that the capital replacement plan is sustainable.



It was noted in the stakeholder feedback, that some specialty vehicles, most notably the air & light truck, has passed its useful life and was not on the replacement schedule.

ESD1 has access to specialty equipment within the metro-area, so the purchase would remain a policy choice within the competing purchase demands.

As noted within the table below, the replacement values are for the unit type and not the total per-year replacement value.

In other words, if there were nine water tankers the total reserve for replacement should accommodate the relative replacement value for nine vehicles.

According to the budget documents, the District's replacement schedule is as follows:

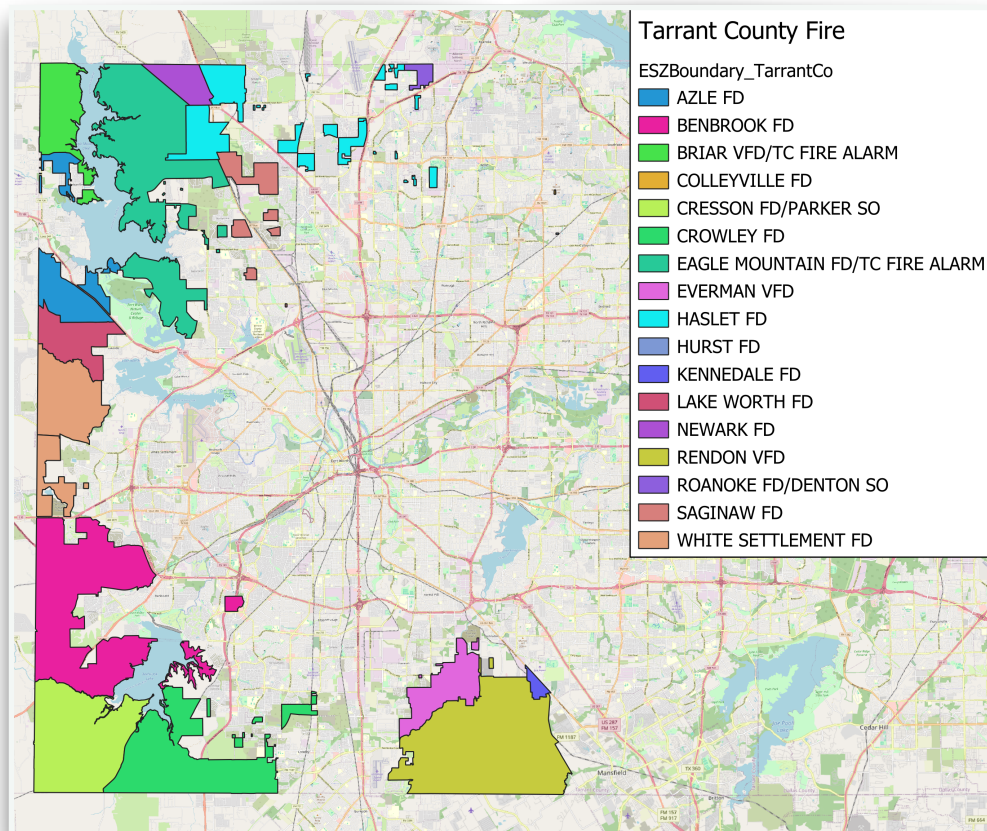
Apparatus Type	Replacement Schedule	Per Unit Reserve for Replacement Value
Type 1 Engine	12 Years	\$95,512
Water Tanker	15 Years	\$92,478
Brush Truck	12 Years	\$28,057
Utility Pick-Up	8 Years	\$7,943
Ambulance	5 years	\$58,081

Community Risk Assessment

To study the unique features of ESD1, the District utilized a comprehensive two-part documented and adopted methodology that organizes response areas into geographical planning zones. The first is by the department's entire response area. The second utilized a more gradual assessment of station demand zones (SDZ). These SDZs have specific resource allocation strategies based on calculated risks. From an emergency response standpoint, the department is divided into 17 SDZs. The SDZs are not divided equally in terms of demographics and population density.

Recommendation

ESD1 should continue to refine and utilize meaningful variables to quantify risk.



Variables of Risk

All variables measured at the SDZ level

- Population density
- Square mileage of each SDZ
- Median age of residents
- Median household income
- Unemployment rate
- Percentage of homes greater than 55 years old
- Community demand
- Call concurrency

Socioeconomic and Demographic Risks

SDZs were utilized to assess each planning zone for risks that inform response time performance objectives. The risk assessment process utilized socioeconomic variables, such as median household income and unemployment, as well as demographic variables such as population density and median age. Other variables considered included square mileage and the percentage of homes greater than 55 years old.

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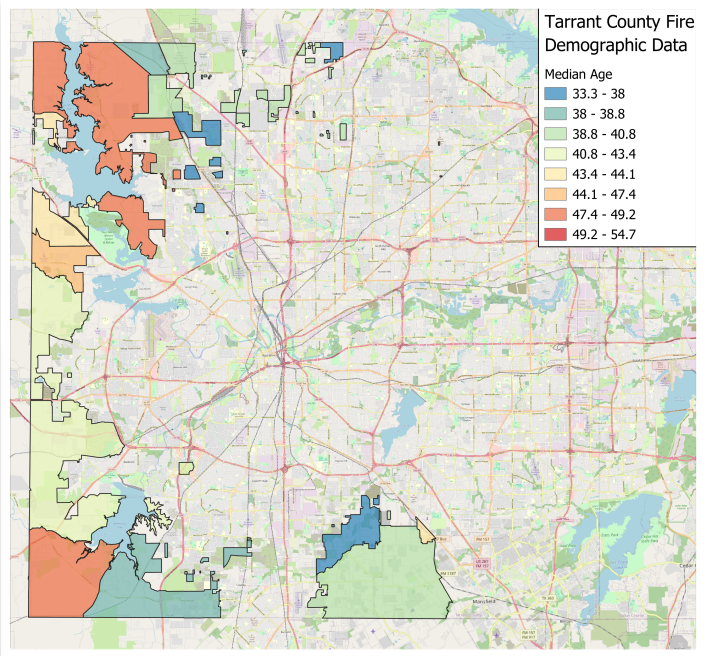
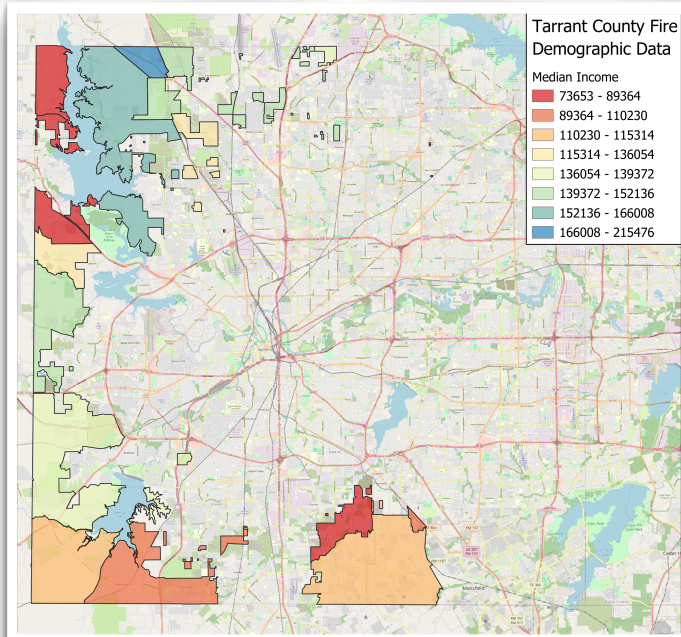
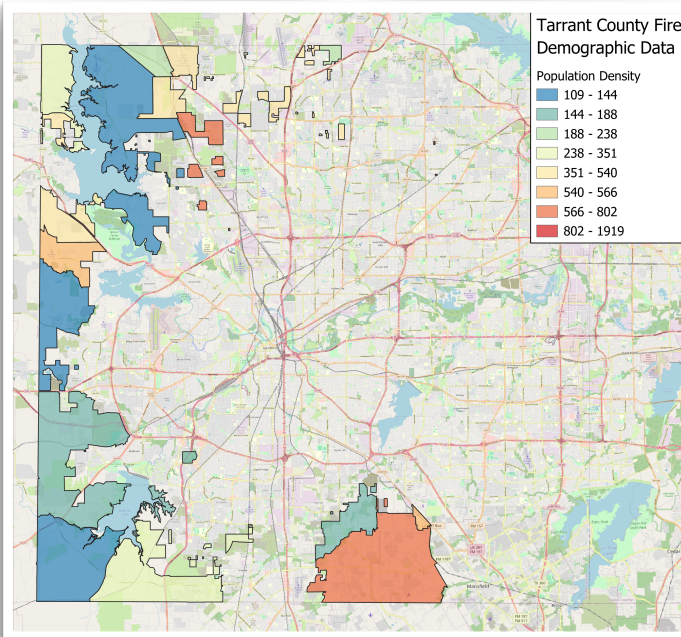
Economic and Demographic Assessment by SDZ

The population for each first due station was calculated using total population for 2019-2023 from U.S. Census Bureau data, and the area of each SDZ in square miles available through GIS mapping from TC911 shape files. As such, population density was calculated as the number of people per square mile in each first due station area (below).

Recommendation

ESD1 should continue to monitor socioeconomic and demographic variables correlated with changes in risk.

Research has demonstrated a relationship between age and use of EMS and fire services or the events leading to the need for EMS and fire services, wherein use and need tend to be highest among older adults, as compared to those in younger age groups (below).



Based on U.S. Census Bureau data for 2019-2023, adjusted for 2023 dollars, median household income for Tarrant County was \$81,905. Within ESD1, the median household income ranges from a low of \$73,653 to a high of \$215,476 (left).

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SDZ Level Risk

Each geographic area was assigned a risk level based on a score composed of economic- and demographic-related data and historic service data. Data are presented for each individual SDZ to reflect their historic data.

SDZs were assigned an overall risk level classification of low, moderate, high, or maximum based on the resulting value of the risk matrices.

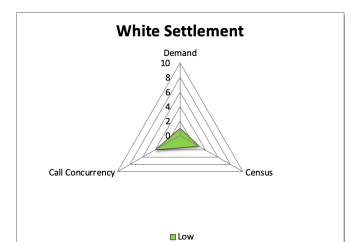
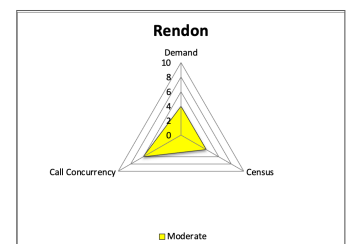
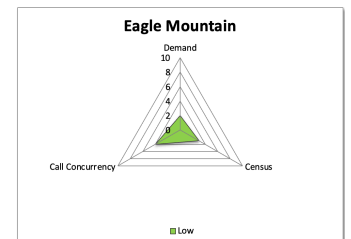
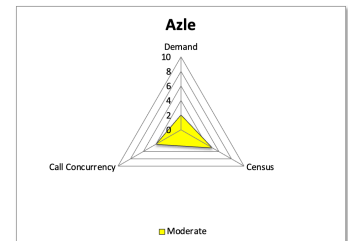
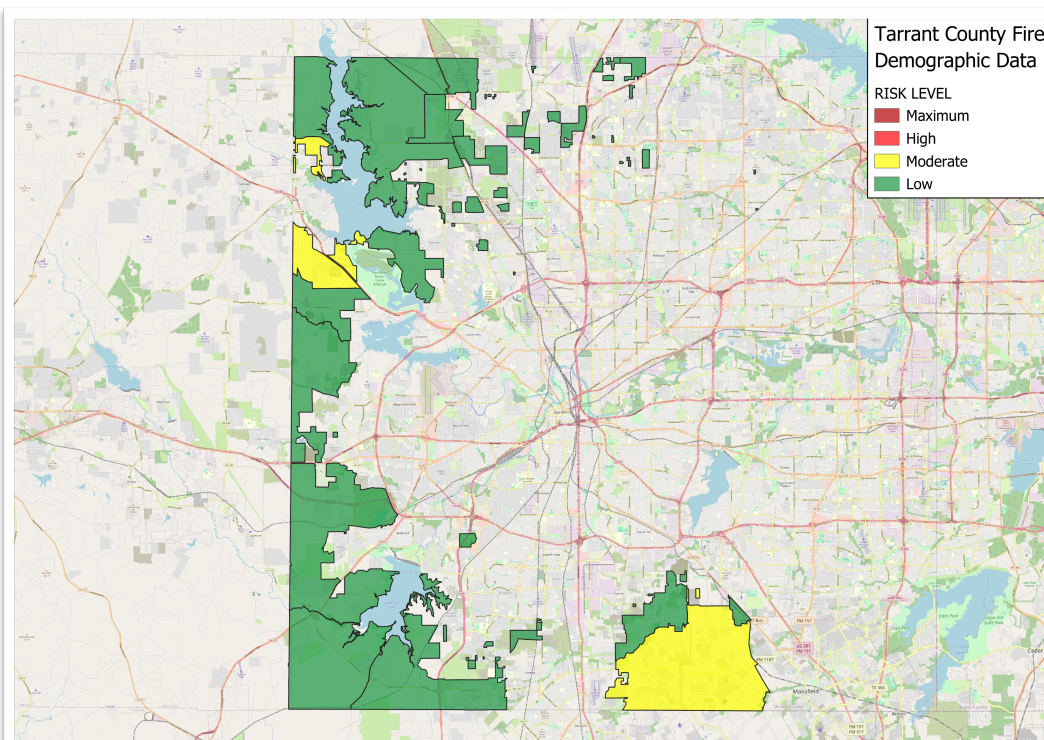
Assessment Category	Variable
Economic and Demographic	Population Density
	Square Miles
	Median Age of Residents
	Median Household Income
	Unemployment Rate
Historic Service	Percentage of Homes ≥ 55 Years Old
	Community Demand
	Call Concurrence

Ultimately, there were no high-risk or maximum-risk SDZs identified. Azle and Rendon were classified as moderate risk (yellow). All remaining areas were classified as low risk.

Recommendation

ESD1 should develop a process to capture occupancy-level risks (building level) and incorporate specific occupancy ratings into the overall risk assessment process and risk matrices.

Finally, 3-dimensional models were created to evaluate each SDZs unique risk.



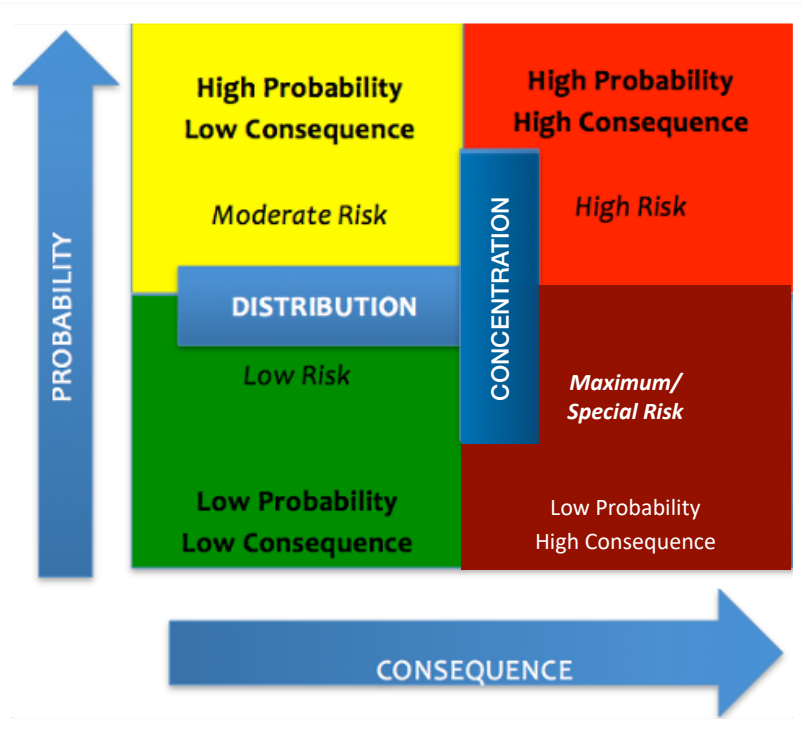
Correlated Risks

Risks may be divided into correlated and uncorrelated risks. All previous risk analyses have been primarily based on uncorrelated risks such as single unique events for EMS or a single property structure fire. Risks were calculated based on socioeconomic and demographic factors that may contribute to unique events. All previous analyses utilized a robust quantitative approach to leasing risk using a 3-axis, 3-dimensional Heron formula.

Recommendation

The department is encouraged to continue to annually review risk severities that are more appropriately defined by the two-dimensional risk assessment process.

However, correlated risks occur with much less frequency and were assessed using a 2-dimensional probability and consequence model. Example of correlated risks would include more regional or system wide events such as natural hazards and pandemics.



Results of the correlated risk assessment process are provided below. The data provided is the average reported risk by ESD1 agencies and Tarrant County (rounded to the next full integer) within the 2020 Tarrant County Hazard Mitigation Action Plan.

Low Risk (0-3)	Moderate Risk (4-7)	High Risk (8-10)
Thunderstorms	Wildfires	Earthquake
Tornadoes	Flooding Events	Pandemic
	Winter Storms	
	Expansive Soils	
	Drought	

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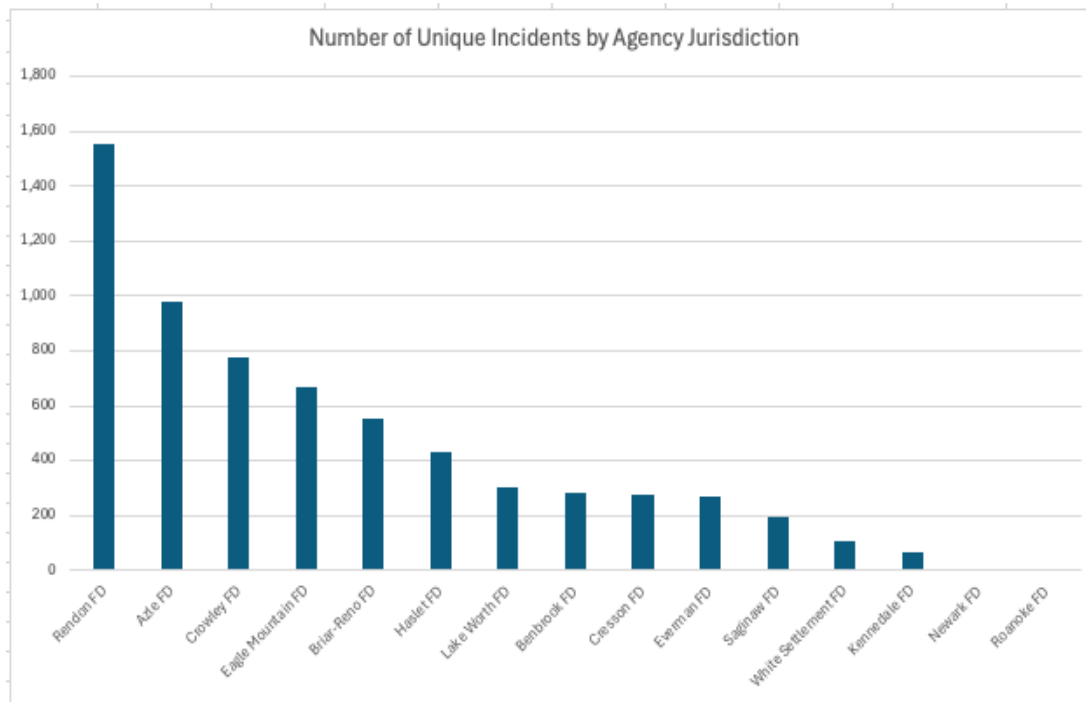


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Historical Service Demands

Workload was also assessed at the demand zone level based on the specific areas within the ESD1 jurisdiction. Within the ESD1 jurisdiction, Rendon's demand zone had the highest volume of unique calls at 1,552 followed by Azle at 977, Crowley with 776, and Eagle Mountain at 671.



Within the data provided, the unique call values found that Rendon and Azle had the most unique incidents. However, when unit activity was evaluated, Eagle Mountain had the third highest activity.

For example, while the 911 data captures the unique value of a single incident, the number of responses provided is largely a local policy choice of each agency.

Overall, the ESD1 system has approximately 31 responses per day with an average time on task of 53.5 minutes. This includes ambulance transports.

Rendon provides coverage for 30.4% of the total system hours.

ESD 1 Responding Agency	Number of Calls ¹	Number of Responses ²	Average Responses per Call	Total Busy Hours	Responses with Time Data ³	Average Busy Minutes per Response	Average Calls per Day	Average Responses per Day	Percentage of Total Busy Hours
Azle FD	977	1,887	1.9	1,817.6	1,881	58.0	2.7	5.2	18.3
Benbrook FD	284	540	1.9	486.0	540	54.0	0.8	1.5	4.9
Briar-Reno FD	551	876	1.6	798.4	875	54.7	1.5	2.4	8.0
Cresson FD	275	289	1.1	231.6	286	48.6	0.8	0.8	2.3
Crowley FD	776	788	1.0	683.8	787	52.1	2.1	2.2	6.9
Eagle Mountain FD	671	1,359	2.0	1,424.6	1,359	62.9	1.8	3.7	14.3
Everman FD	268	513	1.9	548.3	513	64.1	0.7	1.4	5.5
Haslet FD	432	551	1.3	246.6	551	26.9	1.2	1.5	2.5
Kennedale FD	69	81	1.2	122.8	81	90.9	0.2	0.2	1.2
Lake Worth FD	306	448	1.5	217.7	447	29.2	0.8	1.2	2.2
Newark FD	2	2	1.0	2.2	2	66.2	< 0.1	< 0.1	< 0.1
Rendon FD	1,552	3,368	2.2	3,029.2	3,359	54.1	4.3	9.2	30.4
Roanoke FD	0	--	--	--	--	--	--	--	--
Saginaw FD	198	336	1.7	159.6	336	28.5	0.5	0.9	1.6
White Settlement FD	109	154	1.4	183.7	154	71.6	0.3	0.4	1.8
Total	--	11,192	--	9,952.2	11,171	53.5	--	30.7	100.0



Efficacy of Response Time Objectives

A sensitivity to response time has long been a primary driver of EMS system design and resourcing. The prevailing result is an institutional belief that faster is better, where patient outcomes positively correlate with response times. A 1979 study out of King County, Washington, became a foundational piece for developing NFPA 1710 and the CFAI Accreditation Standards. The study concluded that BLS delivered in 4 minutes and ALS delivered within 8 minutes, which positively correlated with patient outcomes. Thus, this set the bar for the standards still influencing system design today. However, the King County study only focused on non-traumatic sudden cardiac arrest (SCA), yet its standards were extrapolated to all call types. A follow-up study by Weaver et al. (1984) became the foundation for the 90th percentile standard of 8 minutes 59 seconds adopted by the American Ambulance Association (AAA). Again, this study focused on witnessed SCA presenting with V-Fib, yet the standard was extrapolated to all call types.

Observations

Evidenced-based clinical research coalesces around a response time of 5 minutes or less to have a statistically significant impact on the risk of mortality for the small proportion of high-acuity incidents.

Response time changes above 6 minutes have limited clinical return on investment and are largely a policy decision.

Much has changed in EMS since these studies, including an expanded body of research regarding the influence of response time on patient outcomes. Empirical research has expanded the scope to include a much wider representation of call types and responses while still considering response times compared to patient outcomes. The culmination of the research indicates that the threshold for response time to influence patient outcome resides around the 5-minute mark. In other words, if a system cannot respond in less than 5 minutes, they are unlikely to positively influence patient outcomes by purchasing any level of performance that cannot meet 5 minutes. However, it is important to recognize that the 5-minute threshold is associated with high-acuity incidents that account for a small proportion of the total calls. A summary of the relevant research is provided below.

Author	Density	Sample Size	Response Time Threshold	Does Response Time Impact Patient Outcome
Blackwell (2002)	ALS Urban	5,424	5 minutes	Yes < 5 minutes; No > 5 minutes
Pons (2005)	ALS Urban	9,559	4 minutes & 8 minutes	No < 8 minutes; Yes < 4 minutes in intermediate/high risk of mortality
Blackwell (2009)	ALS Urban; BLS MFR	746	10:59	No > or < 10:59
Blanchard (2012)	ALS Urban	7,760	8 minutes	No > or < 8 minutes
Weiss (2013)	Metro/Urban and Rural	559	N/A Continuous Variable	No relationship between time and clinical outcomes
Pons (2002)	ALS Urban	3,490	8 minutes	No > or < 8 minutes after controlling for severity of injury
Newgard (2010)	ALS Urban	3,656	4 minutes & 8 minutes and Golden Hour	No time intervals were statistically related to mortality including response time, on-scene time, transport time, or total EMS time
Band (2014)	ALS Urban; BLS MFR	4,122	N/A Continuous Variable	Adjusted for severity of injury, no significant difference between PD and EMS. In patients with severe injuries, gunshot, or stabbing more likely to survive if transported by POLICE.

Additional research has examined the efficacy of emergency, or lights and sirens, responses. While emergency responses do produce statistically quicker responses and transports, very few have clinical implications for patient outcomes. Studies also found that emergency responses were warranted in less than 10% of ambulance transports, and hospitals didn't utilize the time savings created upon arrival to the emergency department. At the same time, community risk increases with emergency responses as units navigate against the established traffic practices. Research has shown that most accidents involving emergency vehicles occur while they are responding lights and sirens.

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Historical Performance

The department understands the relative opportunity to improve the citizens' experience by maximizing the efficiency of the dispatch interval and turnout time. Dispatch Time is defined as the time from when the 911 center receives a request for service unit the fire department is notified to respond. Turnout Time is defined as the time between the fire department being notified of a call (dispatched) and when they are actually driving to the incident.

The National Fire Protection Association (NFPA) 1710 and 1225, recommend a 64- and 60- second dispatch time, respectively. The current performance is 2.4 minutes for all types of calls at the 90th percentile.

Similarly, the NFPA and the Commission on Fire Accreditation International (CFAI), recommend a turnout time of 60-seconds for EMS incidents and between 80 and 90 seconds for non-EMS incidents, respectively. The current performance is at 2.9 minutes for EMS and 4.1 minutes for fire related incidents, both exceeding the recommended best practice performance.

Travel Time is measured from when the apparatus and crews make notification that they are driving to the incident until they notify that they are on-scene. The CFAI had historically provided for a 13-minute travel time at the 90th percentile for rural areas. The current 90th percentile performance of 11.5 minutes is outperforming the accreditation recommendation by 1.5 minutes.

NFPA 1720, the standard for combination and volunteer departments, provides direction for a response time of 9 minutes at 90% (urban); 10 minutes at 80% (suburban); and 14 minutes at 80% (rural). However, unlike 1710, NFPA 1720 defines response time as the sum of both turnout and travel time.

Recommendations

ESD1 should ensure that staffed turnout time well-aligned with best practices of 1.5 minutes at the 90th percentile.

Improving Turnout Time has an excellent return on investment for improving the citizen's total response experience.

ESD 1 Demand Zone	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size ¹
Azle	2.4	2.8	9.0	13.0	364
Benbrook	2.5	4.4	13.9	18.6	197
Briar-Reno	2.6	2.5	10.2	14.0	336
Cresson	--	--	11.0	15.8	146
Crowley	2.2	2.4	14.2	17.2	588
Eagle Mountain	2.5	3.7	10.1	15.2	306
Everman	2.3	3.0	9.3	13.2	104
Haslet	3.3	1.4	12.5	15.1	104
Kennedale	--	--	--	--	0
Lake Worth	2.2	0.9	10.5	12.3	59
Newark	--	--	--	--	5
Rendon	2.5	3.4	10.4	14.9	1,011
Roanoke	--	--	--	--	0
Saginaw	3.3	1.4	11.5	13.8	48
White Settlement	2.4	2.5	13.2	17.8	55
Total	2.4	3.2	11.5	15.3	3,323

Response Time is the total time from 911 receipt to arrival.

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Distribution Study

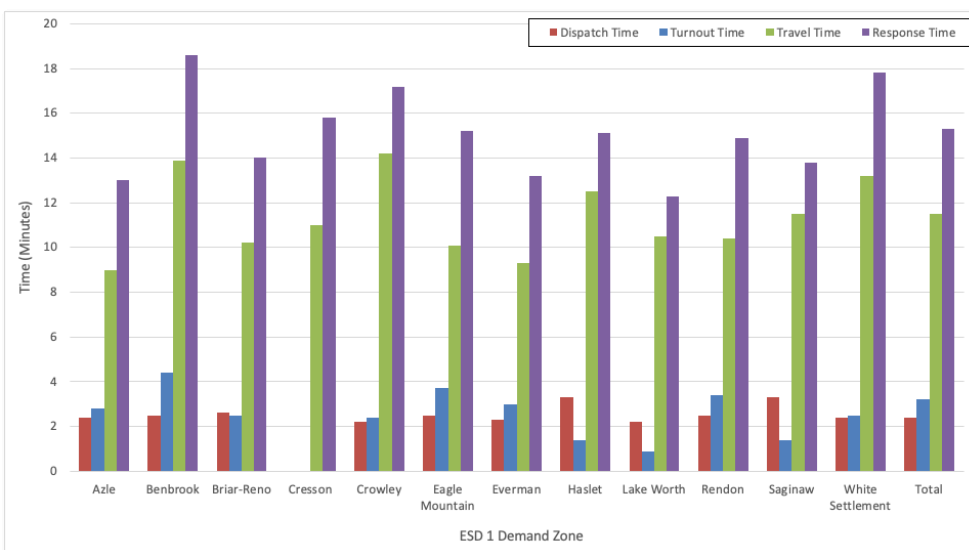
Response time elements are evaluated by SDZ. Consistent with other comparable departments, the SDZs provide a travel time between 9.0 to 14.2 minutes at the 90th percentile. The shortest travel time was at Azle and Crowley had the longest travel time.

Observation

There is a reasonable amount of variability in response times across the providers' response areas.

The maximum difference is calculated at ~5 minutes between the shortest (Azle) travel time and the longest (Crowley).

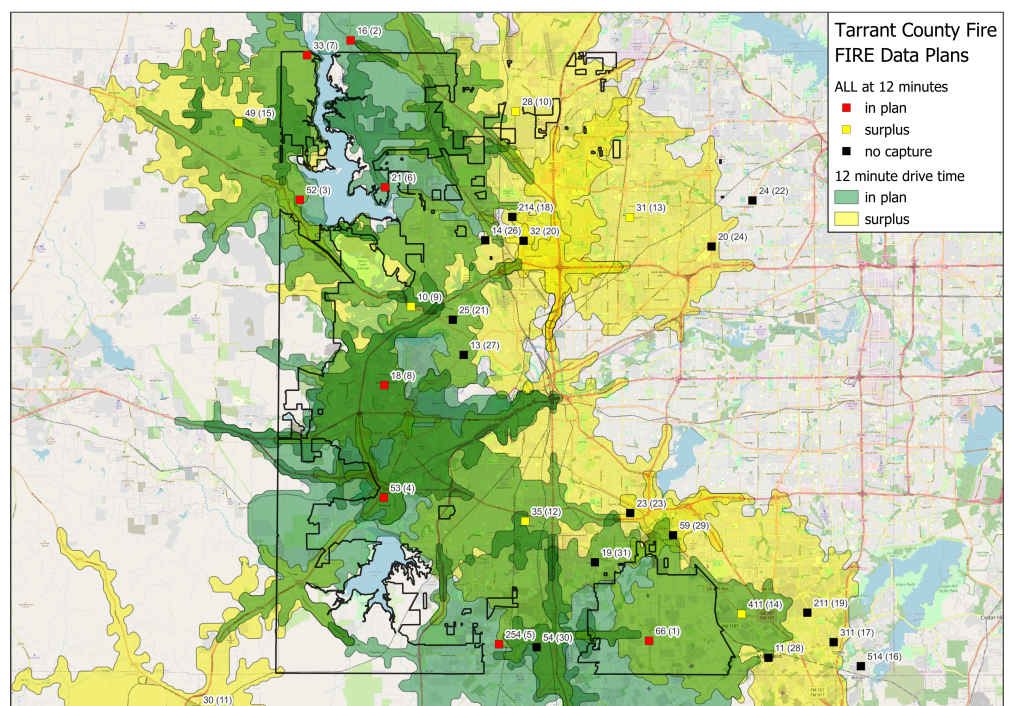
However, when considering the total response time, Lake Worth had the best performance at 12.3 minutes and Benbrook was the longest at 18.6 minutes at the 90th percentiles.



GIS analyses validated that 96.65% of the incidents could be responded to within a 12-minute travel time from the current station configuration.

The green shaded areas indicate the 90.19% response capability within 12 minutes. Any successively darker shades of green indicate that more than one station can service the area within 12 minutes.

The yellow shaded areas show the additional coverage within 5 minutes between 90% and 96%.



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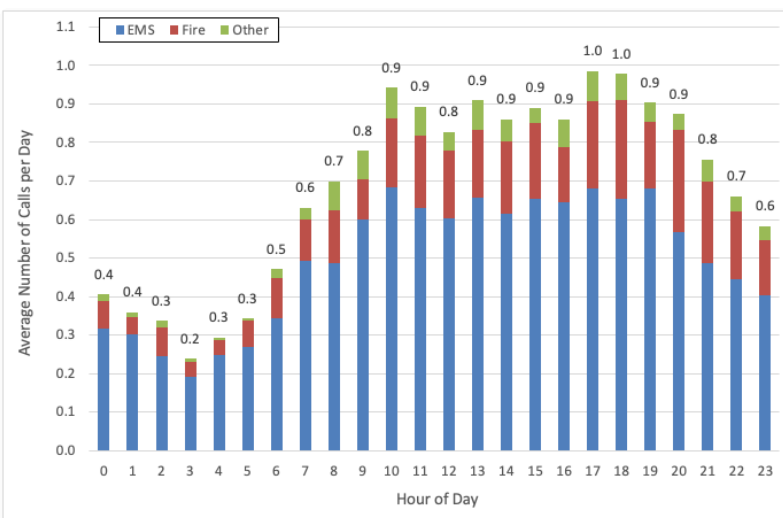
Concentration Study

The concentration of resources sufficient to respond to the frequency and duration of the community demand is utilized to evaluate the efficacy of the deployment strategy for the identified risk. Analyses reveal that the department has an average hourly demand of approximately 1.0 calls per hour during peak periods.

Observation

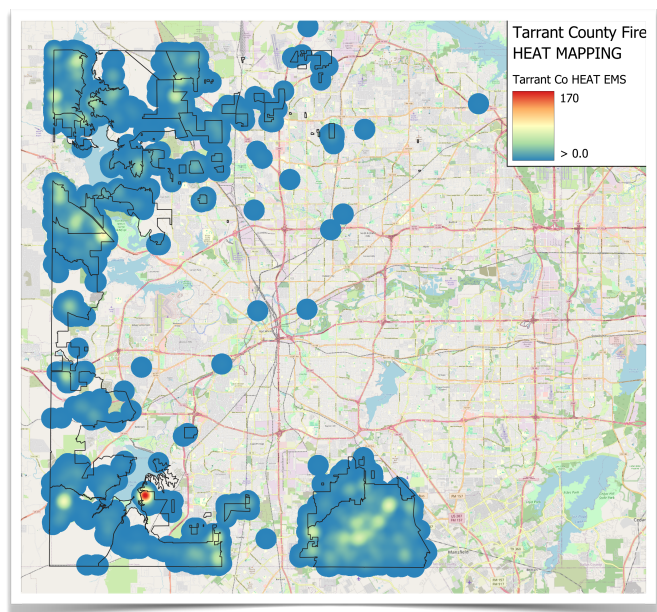
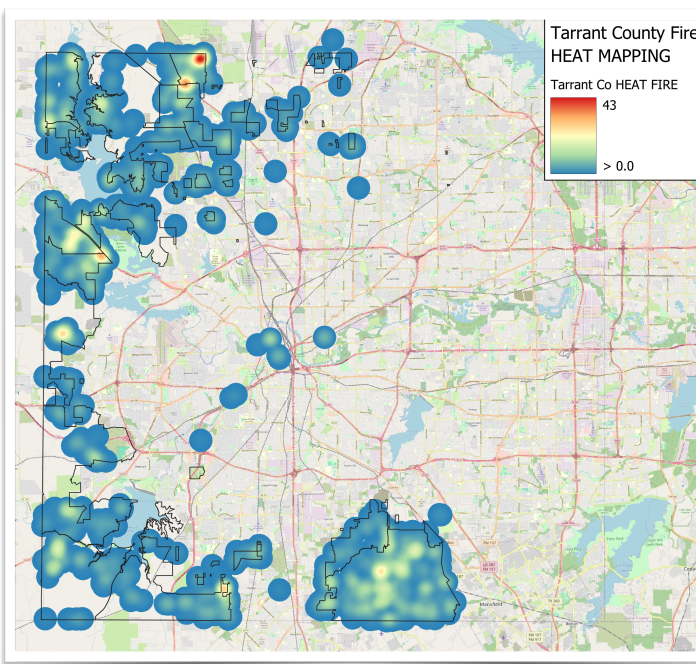
ESD1 has a challenging geographic area to cover.

However, on average, the District has one call per hour during the busiest part of the day.



Heat maps were created and utilized to measure the concentration of incidents across ESD1.

EMS incidents are provided (below). The highest single point of concentration of EMS incidents are in Crowley.



Fire related incidents had the highest single point of concentration of fire incidents in Haslet's area of responsibility followed by the borders of Azle and Lake Worth and then Crowley (left).

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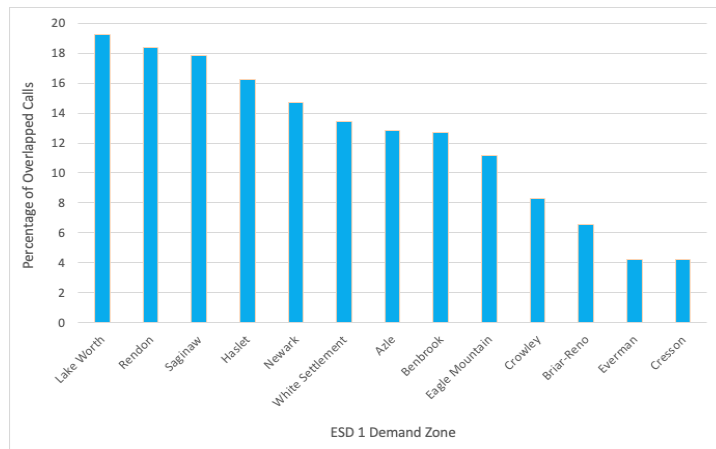


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Assessing System Resiliency

Lake Worth experienced the highest percentage of overlapped calls during 2023 at 19.2%, followed by Rendon at 18.4%. All agencies had a call concurrency rate of less than 20%.



Observations

The system resiliency is generally robust.

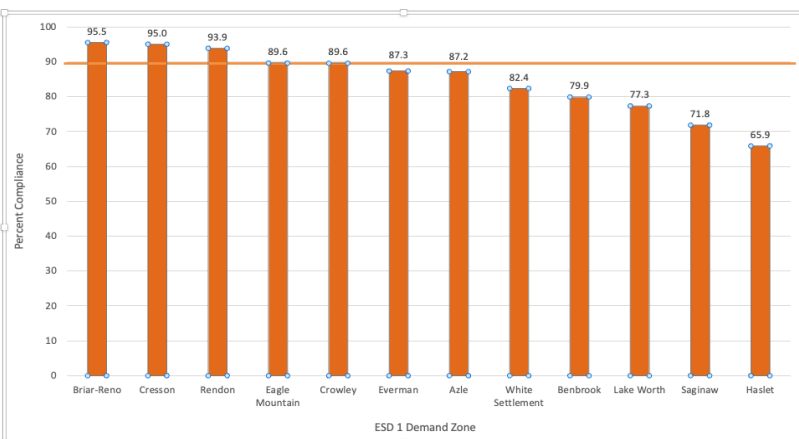
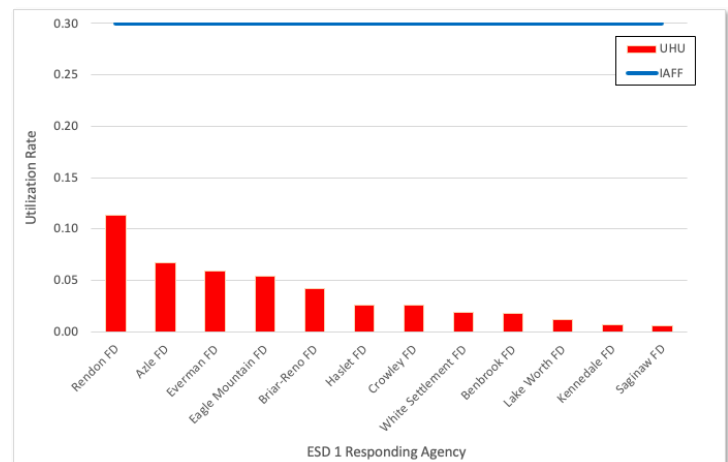
Overall, all agencies had a call concurrency rate of less than 20%.

All agencies had a UHU of 7% or less other than Rendon at 11%.

Overall, the station reliability was good. Challenges with the data may introduce some artifact in this specific measure.

Unit Hour Utilization (UHU) is an objective measure of time on task for deployed resources. ESD1 is as busy as other similarly sized jurisdictions that provide EMS, fire suppression, and rescue services.

All units had UHU values < 0.15. Rendon had the highest UHU at 11% followed by Azle, Everman, and Eagle Mountain. All other agencies had a UHU less than 5%.



Station reliability is a measure of the ability of the units assigned to a specific station to respond to the calls within their first due SDZ.

Briar-Reno and Cresson had the highest reliability at 95.5%, closely followed by Rendon at ~94%. Haslet had the lowest reliability at 66%. Overall, four agencies had a reliability of less than 80%.

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Commensurate Risk Model and Projected Growth

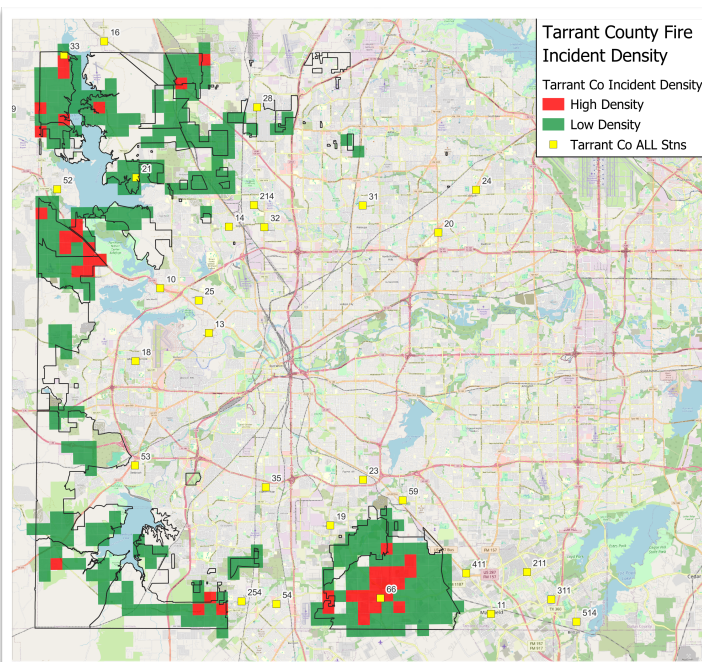
The call density analysis calculates the relative concentration of incidents based on approximately 0.5 geographic areas and at least half of the adjacent 0.5 grids. The assessment is based on call density and not population. The red areas are designed as urban level service areas and green areas are designed as rural (below).

Observations

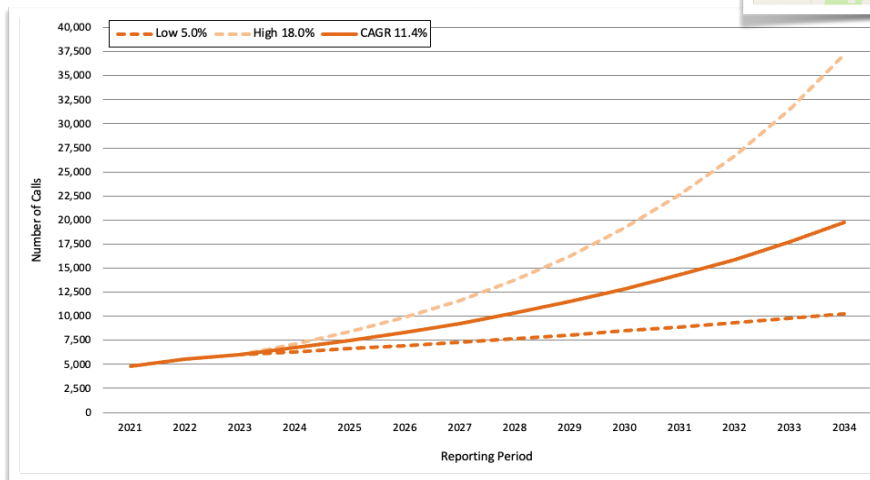
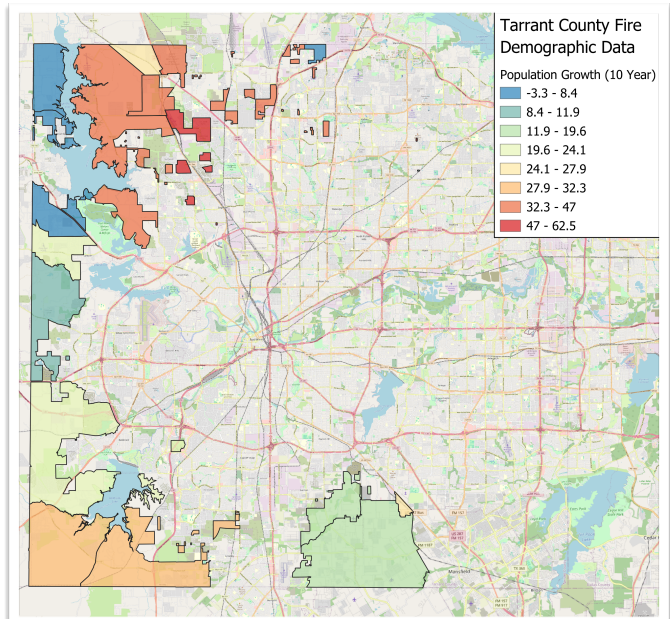
The commensurate risk assessment validates that the stations are placed well and targets the areas with higher call densities.

Calls are increasing by 11.4% per year.

Population growth projections through 2033 were evaluated by SDZ.



The northern and southern regions have the highest project growth (right).



The available data set included five reporting periods of data, representing FY 2021-2023. Calls for ESD1 services increased with an average annualized growth rate of 11.4% per year. The figure to the left depicts observed call volume during the last two-year reporting periods and various hypothetical growth scenarios through 2033.

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ISO Considerations for Station Coverage

The most recent Public Protection Classification (PPC) provided by the Insurance Services Office (ISO) assigned the agencies within ESD1 is summarized below. One challenge for the community is the lack of hydranted water supply (or other credible water supply) in some areas. Following ISO's evaluation process, any properties that are within 5 road miles but greater than 1,000 feet from a hydrant (or alternative water supply) are designated as a "Y" rating. Properties within 5 miles from a fire station and within 1,000 feet from a hydrant (or alternative water supply) are designated as a "1-8" rating. The "X" classification in a split rating replaces the Class 9 that has no creditable water supply. A Class 10 remains as an unrated territory.

Agency	Year	Rating
Azle	5/1/17	3/3Y
Benbrook	12/1/18	2/2Y
Blue Mound	1/1/12	6
Briar	4/1/99	9 & 10
Colleyville	1/1/20	2
Cresson	7/1/15	3/3Y
Crowley	7/1/14	2
Eagle Mountain	7/1/15	5/5X
Everman	6/1/17	4/4X
Haslet	1/1/22	3
Haslet FDS	1/1/22	6 & 10
Kennedale	4/1/17	3/3X
Lake Worth	12/1/16	2/2X
Newark	6/1/18	4/4Y
Rendon	12/1/16	3/3Y
Roanoke	4/1/16	2/2X
Saginaw	7/1/15	2/2Y
White Settlement	2/1/13	4

Therefore, in reviewing the most recent PPC/ISO ratings provided by ESD1 reveals that Briar, Eagle Mountain, Everman, Haslet, Kennedale, Lake Worth, and Roanoke all have some portions of the territory that are without a creditable water supply.

These analyses did not have sufficient detail within the shape files to determine the extent of the areas of responsibility that is built upon but beyond 1,000 feet from a hydrant. These areas designated as "Y" may be improved by demonstrating a sufficient and continuous water supply as an alternative water supply. This is typically accomplished through a robust tanker shuttle process.

Similarly, these analyses did not have sufficient detail within the shape files to determine the extent of the areas of responsibility that are without a creditable water supply. The primary mitigation strategy is nearly universally associated with providing creditable water supply. In other words, this is an infrastructure policy

Observations

At the time of the last PPC ratings, the only areas that are rated at greater than 5-miles from a fire station is part of Briar's and Haslet's areas of responsibility.

The primary mitigation strategy is nearly universally associated with providing creditable water supply.

In other words, this is an infrastructure policy for Tarrant County and outside of the ability for ESD1 to mitigate autonomously.

for Tarrant County and outside of the ability for ESD1 to mitigate autonomously.

Finally, at the time of the last PPC ratings, the only areas that are rated at greater than 5 miles from a fire station are part of Briar's and Haslet's areas of responsibility. The remaining areas had built upon areas within 5 miles of a fire station, but did not have a creditable water supply.

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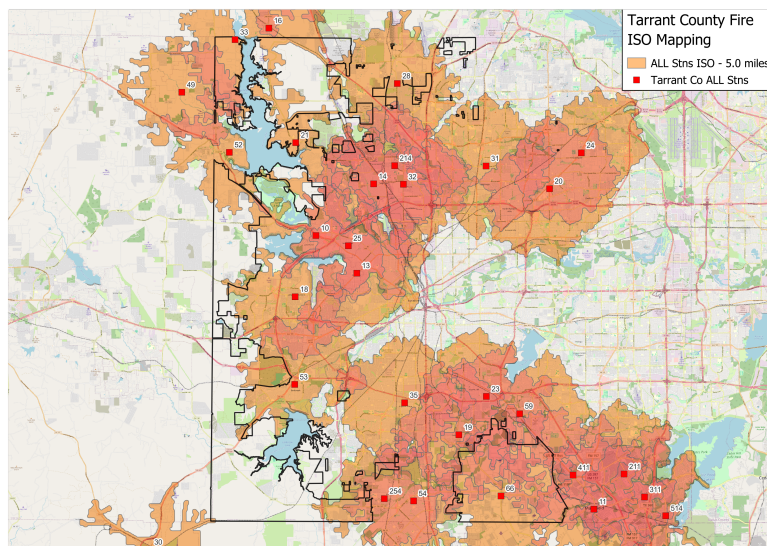
ISO - Current Station Coverage

An evaluation was completed to assess the capability to have a fire station within 5 miles of all built upon areas within ESD1. The 5-mile threshold is intended for only built-upon areas. This analysis is not

restrictive to only built-upon areas, therefore, this analysis may understate the existing coverage.

First, an assessment of all stations within the current ESD1 environment was completed (above). The mapping demonstrates that much of Eagle Mountain, Azle, Lake Worth, White Settlement, Benbrook, Cresson, and Crowley are outside of 5 road miles.

Second, an assessment of all stations and selected Fort Worth fire stations were utilized to assess if the Fort Worth stations had a positive benefit on the coverage within 5 miles. Overall, there is some better coverage in portions of White Settlement and Eagle Mountain, but limited impact to the remaining areas.

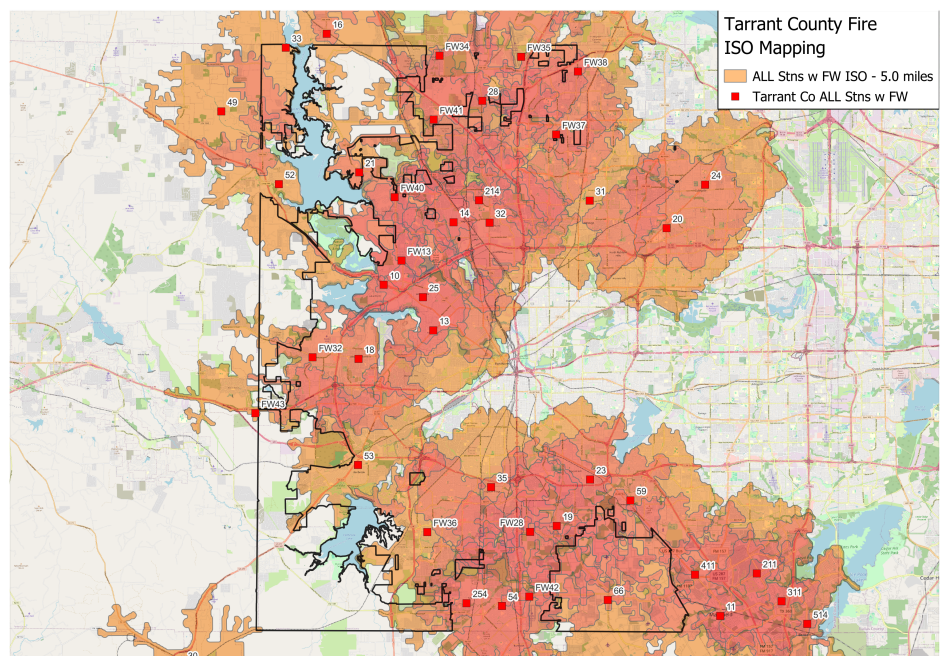


Observations

The mapping demonstrates that much of Eagle Mountain, Azle, Lake Worth, White Settlement, Benbrook, Cresson, and Crowley are outside of 5 road miles.

Overall, there is some better coverage in portions of White Settlement and Eagle Mountain, but limited impact to the remaining areas.

Additional stations may be required.



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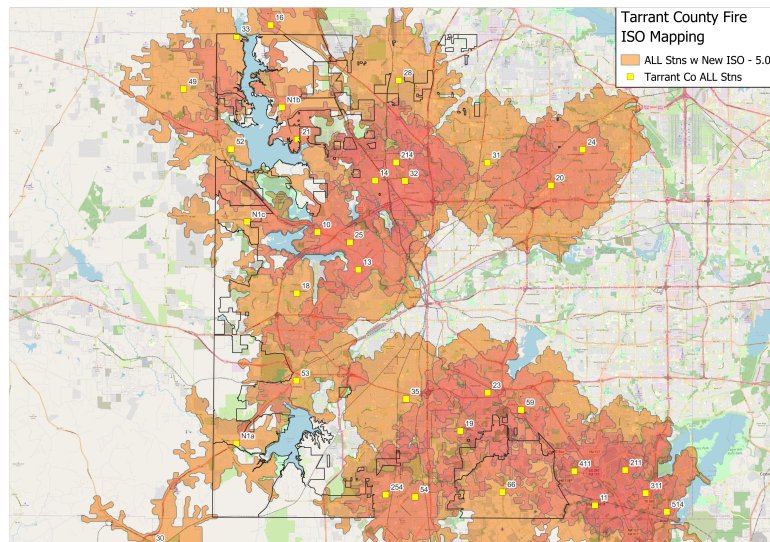
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ISO Considerations for Station Coverage

An evaluation was completed to assess the capability to have a fire station within 5 miles of all built upon areas within ESD1. The 5-mile threshold is intended for only built-upon areas. This analysis is not

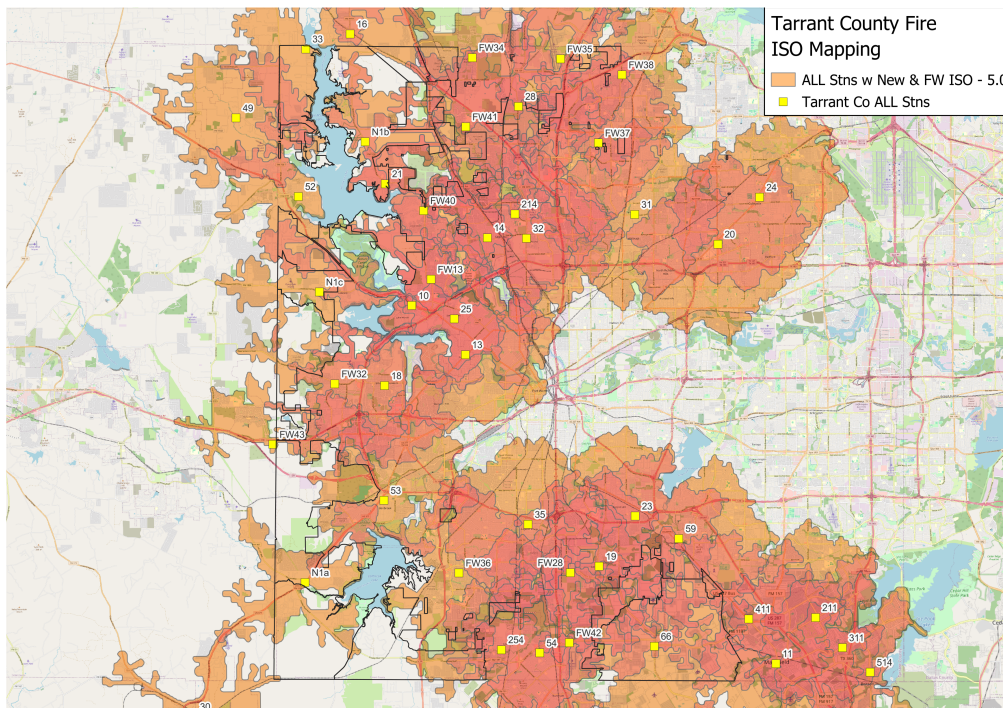
restrictive to only built-upon areas, therefore, this analysis may understate the existing coverage.



Observations

The three proposed station locations improves coverage within 5 road miles.

Overall, the agency will have to continue to monitor development and may need additional stations to cover development within 5 road miles of a fire station.



Continuing with the previous assessment, three new stations were proposed that provide improved coverage. The new stations are identified as N1a, N1b, and N1c (above).

In addition, the new stations' assessment was replicated including the Fort Worth stations (left).

In both evaluations, the new station locations address areas of need that were beyond the 5-mile coverage.

Considerations for Three New Stations

Continuing with the challenges with water supply and areas outside of the 5-road miles of fire stations, three locations were identified as prioritized locations. First is (N1b) Eagle Mountain with a location moved northwest of the existing station and covers the resort area within question. This would be recommended as the first priority if new stations cannot be complemented simultaneously. It is recommended that the staffing is 100% funded by the District, but operated by Eagle Mountain's fire department through a performance-based contract. This would be consistent with the strategy for EMS services as well.



Second would be a new station in the Whiskey Flats community. As the second highest priority, this station and apparatus would be owned by the District. However, it is recommended that the staffing is 100% funded by the District, but operated by a contiguous area fire department through a performance-based contract. This would be consistent with the strategy for EMS services as well.

The third location is west of Lake Worth. Discussions with local experts and validated by the GIS analyses would suggest that this is a good location to meet the intent of the ISO 5-miles configuration. However, this station has greater flexibility within the policy choice of whether to immediately staff the station and to what degree. Currently, the station location would not be within the prioritized investment strategy. Therefore, this station may continue as a substation with dedicated apparatus, but without staffing until the policy desires or operational needs identified an elevated priority.

Recommendation

The District should build three new fire stations to address remote areas outside of the 5-mile fire station threshold.

The order of priority should be Eagle Mountain, Whiskey Flats, and Lake Worth.

Category of Spend	Square Footage	Estimated Construction Cost	Annual Replacement
Headquarters Fire Station	12,000	\$5,593,638	
Fire Substation	8,900	\$4,148,615	
Fire Substation	8,900	\$4,148,615	
Land Acquisition (3 sites)		\$1,100,000	
Furnishings		\$300,000	
Est. Total Expenses		\$15,290,868	\$414,254

Staffing costs will be provided within a subsequent analysis.

Considerations for Tanker Coverage

Consistent with the analysis on the ISO ratings within Tarrant County ESD1, water supply is a major contributor to the challenges with insurance coverage. ESD1 has some control over the locations of fire stations within 5 miles of built upon areas, but maintains little authority for planning, zoning, land use, and the infrastructure such as a robust fire hydrant system.

Currently, ESD1 supplied Tanker apparatus with mobile water supply to Azle (St. 52), Benbrook (St. 53), Crowley (St. 54), Eagle Mountain (Station 21), Everman (Station 19), Haslet (St. 28), Lake Worth (Station 10), Rendon (Station 26), and Saginaw (Station 14). The deployment strategy of the tankers could not be validated within this study because the data did not provide the specificity of the exact geographic areas in question. Therefore, these recommendations are reliant on the long-standing expertise of ESD1 and the participating agencies and can be refined as needed.

ISO provides an opportunity for the agencies to demonstrate the ability to provide a continuous water supply following a tanker shuttle operation. Therefore, the primary recommendation is for ESD1 to begin funding 100% of the costs of supplying one dedicated firefighter 24/7 that can drive and operate mobile water supply.

Recommendation

ESD1 should begin funding 100% of the costs of supplying one dedicated firefighter 24/7 that can drive and operate at Rendon, Whiskey Flats, and Eagle Mountain.

It is estimated that each tanker would cost approximately \$280,280 to cover 24/7 with relief staffing.

Expansion of the program can be phased in as fire-ground staffing is improved.



Therefore, it is recommended that the District fund a staffed tanker at Rendon, Whiskey Flats, and Eagle Mountain. Expansion of the program can be phased as fire-ground staffing is improved.

Secondly, ESD1 should coordinate with the agencies for driver certifications and training, operational training, and the coordination of all nine agencies to demonstrate a timely and efficient tanker shuttle operation to provide

continuous water supply. Ultimately, performance expectations should be established as a competency-based expectation for continued funding.

Finally, once the staffing and operations meet expectations, ESD1 and the agencies should discuss the timing of demonstrating to ISO the ability to provide continuous water supply to the areas that do not have water supply and within 5 miles of a fire department. It is understood that there may be competing interests in the timing of said demonstration.

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Efficacy of a ESD1 as the Provider

The District is in good financial position and has a much more robust ability to meet the demands of a growing service area. However, there are limits to the opportunities that the District can entertain. For example, the District could not fully fund 24/7 services for both fire and EMS services.

Therefore, consideration should be given to the policy choice of having District employees and when and why they would be used. Of course, this is purely a policy choice for the District board, but the recommendation is that the District continue to contract for most of the operational service provisions. For example, EMS, tanker coverage, and fire suppression may be better served by contracting with existing service providers.

Observation

The District would not be able to fully fund 24/7 services for both Fire and EMS.



If the District elects to fund 100% of the EMS costs, it is recommended that patient billing is outsourced. The cost of billing services is generally between 4% and 6% of collections.

However, the District should consider direct employees for elements such as executive leadership, administrative support, and regional operational items such as a Battalion Chief.

The assumptions for the cost of each employee or contractee are provided below.

Type	Salary	Benefits	Total
Firefighter/EMT	\$70,000	\$21,000	\$91,000
Firefighter/Paramedic	75,000	22,500	97,500
Lieutenant / Officer	95,000	28,500	123,500
Battalion Chief	130,000	39,000	169,000
Executive Director	155,000	46,500	201,500
Administrative Support	55,000	13,750	68,750

Consideration for Performance-based Contracting

The District administration is already taking steps to introduce performance-based criteria in the provider contracts to ensure optimal operational performance as well as greater accountability and transparency with public dollars spent on emergency services.

This recommendation is provided to support the District in this endeavor and reinforce the value of having performance-based contracts when you are responsible for the provision of services, but not the primary provider of services. The following high-level categories are offered to demonstrate the depth and breadth of items that should be considered when framing performance-based contracts in the future.

Fiscal and Administrative Considerations

- Ongoing financial accountability and reporting of all District dollars that is tied to installments from the District.
- Annual financial audits required of all 501.c.3 or 501.c.4 agencies.
- Municipal budgeting with GASB accounting and annual audits for agencies with substantive investment such as staffing.
- Require coordination and accountability of EMS reporting, documentation, and accuracy.
- Include a mechanism to reduce funding when quality and accuracy thresholds are not met.
- Ensure professional and responsible care of District assets and appropriate routine preventative maintenance.

Recommendation

The District is encouraged to continue the development of performance-based criteria in the provider contracts.

The District should work with the 911 provider, or explore alternative providers, to ensure that the data capabilities can support the desired system of measures.



Operations

- Ensure resources are deployed as designed with fidelity.
 - Include restrictions on the provider for District funded human capital (or the equivalent FTE) to ensure the appropriate return on investment.
 - EMS providers are to provide dedicated resources with closest unit dispatching throughout ESD1.
 - EMS providers should be prohibited from providing any non-emergent transfers.
 - Contractors should meet the established "Performance of Measures" for items such as **Turnout Time, Travel Time, and Reliability**.
- Establish minimum certifications, credentialing, and/or competencies defined by ESD1.

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Adopting a System of Measures

However, it is still important to measure and manage the efficiencies of a well-run operation using a system of measures as presented in the table below. In this manner, the daily management continues in place, but the strict adherence to system design performance is secondary to the outcomes measures. For example, if response time increases and there is no change in outcomes then it would be purely a policy choice to act. Conversely, if the outcomes change, then the department leadership will turn to the system of measures and attempt to discern which of the variables or combination of variables may be contributing to the change in outcomes.

Recommendations

The District should adopt a system of measures to ensure accountability to the desired performance objectives.

In addition, the District should utilize a system of measures to transparently identify system needs and future investments.

The summary of measures provided below includes all aspects of time, apparatus staffing by type, relative risk ratings, and system resiliency measures such as reliability, call concurrency, workload, and unit hour utilization. For example, reliability should be at least 70% for each station, and only if the reliability drops below the 70% threshold before considering a mitigation reaction. Similarly, call concurrency is credible until the call concurrency reaches 70%. In other words, only 30% of the calls are overlapping. Call concurrency is suggested as a per-unit threshold unless the majority of calls are multi-unit responses. For example, if there are two units assigned to a station, the station-level call concurrency can perform well at 60% or less for single unit responses. Finally, the cross-staffed strategy applies to an upper call volume threshold of no more than 1,500 calls per year (4 calls per day) and a call concurrency of 15% or less. Under these conditions, units can typically be cross-staffed.

The system of measures provided are not intended to be overly prescriptive. The District should adopt the system performance objectives internally and update as needed.

Type of Measure	Performance Metric	Recommended Performance Urban	Priority	Review Period
Station/Unit Performance	Turnout Time – EMS	≤1.0 Min at 90%	All Emergency EMS Calls	Quarterly
	Turnout Time – All Other	≤1.5 Min at 90%	All Responses	Quarterly
	Travel Time	≤12 Min at 90%	All Emergency Responses	Quarterly
	Minimum Engine Staffing	≥1 FF/EMT ≥1 FF/Lieutenant	All Responses	Daily
	Minimum Ambulance Staffing	≥1 FF/PM ≥1 FF/EMT	All Responses	Daily
System Design and Performance	Dispatch	≤2 Min at 90%	All Emergency Calls	Monthly
	Station Risk Rating	Increases in Risk		Annually
	Reliability	≥70%		Quarterly
	Call Concurrency	≤15%		Quarterly
	Call Volume	3,000 – Initial 1,000 – Ongoing		Annually
	Unit Hour Utilization	≤0.25 on 24-hour ambulance units ≤0.15 on 24-hour Engine and Aerial units ≤0.45 on 12-hour ambulance units		Quarterly
	Cross-Staffing at Unit Level	<1,500 annual calls and <15% Call Concurrency		Annually

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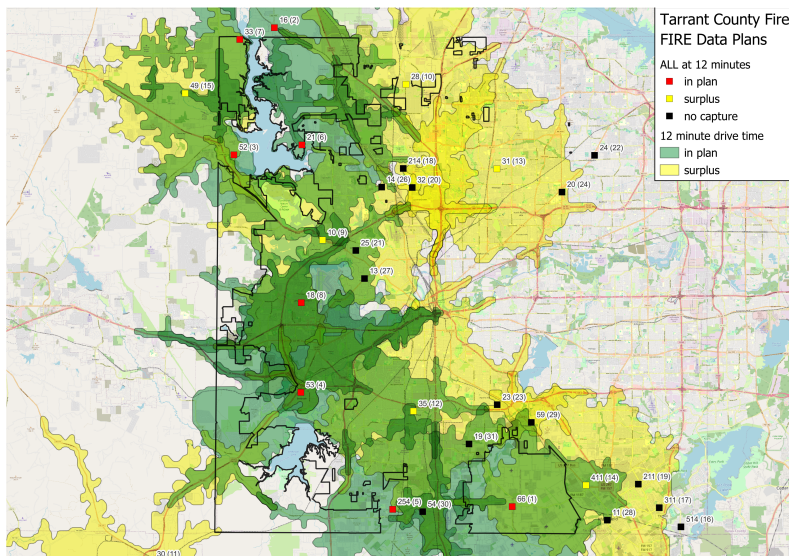
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Assessment of Current Fire Deployment

The previous fire station location study demonstrated that an 8-station configuration is well positioned to deliver a 12-minute travel time to greater than 90% of the fire incidents. The GIS analyses utilized average road speeds, so it would not be uncommon for the fire department to outperform the modeling by several percentage points while utilizing lights and sirens responses that do not strictly adhere to non-emergency traffic behavior.

Recommendation

Within the current station configuration, eight prioritized stations can maintain a 12-minute travel time to 90% of the fire related incidents.

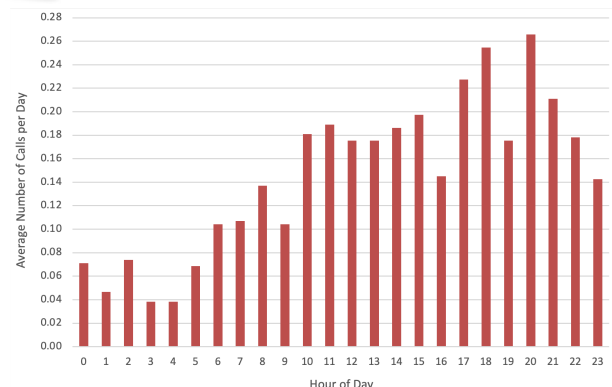


However, ESD1 is actually performing at 11.5 minutes at the 90th percentile. Therefore, maintaining current performance could be efficiently managed through eight prioritized stations.

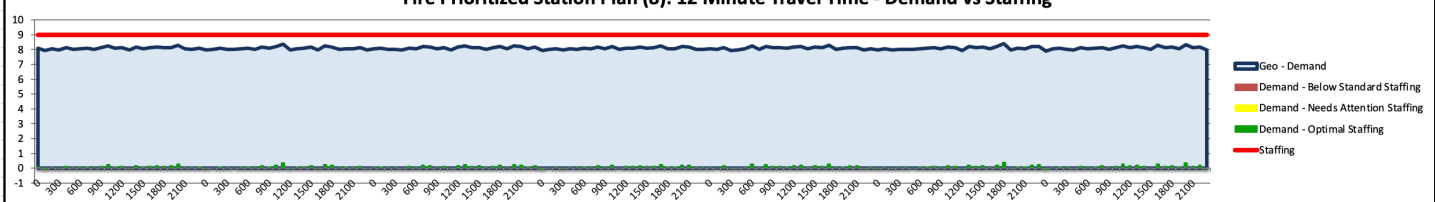
Understanding that the average demand throughout the peak of the day is less than one call per hour, the number of fire (non-EMS) resources should be nine.

The following staffing-to-demand assessment considers the current staffing-to-demand to meet a 12-minute travel time and the actual call durations throughout each day of the week. The RED line indicates the deployed resource, and the BLUE line indicates the combined demand for both response time compliance and resources.

Results demonstrate that nine resources deployed from eight stations can maintain the current travel-time performance.



Fire Prioritized Station Plan (8): 12 Minute Travel Time - Demand vs Staffing



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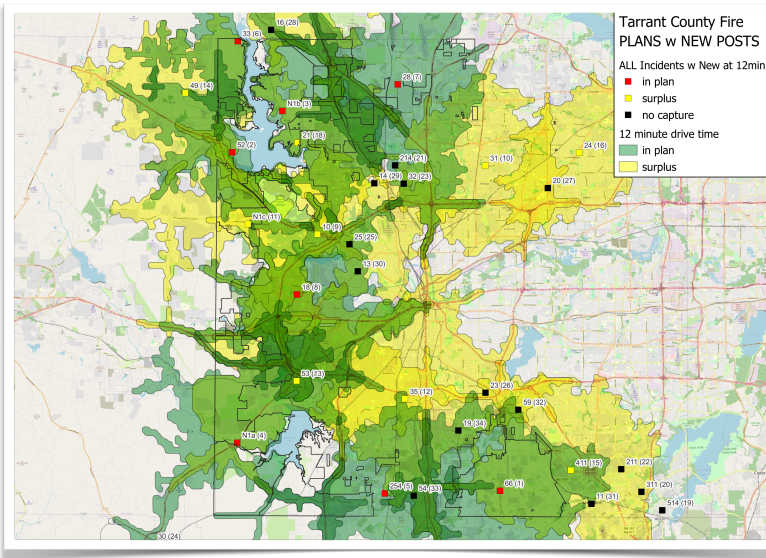
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Considerations for Prioritizing Fire Expenditures

The following marginal utility analysis provides the District with some guidance on where the greatest return on non-EMS investment exists. These are provided to posit the most efficient operational design as well as guide the policy discourse on the prioritization of investments.

Analyses suggest that an eight station and nine fire engine configuration could maintain the current 12-minute travel time to ~93% of all incidents. When referring to the marginal utility analyses below, each station locations' relative contribution to accomplishing a 12-minute travel time is outlined in the last column labeled "Percent Capture". This cumulative value demonstrates that, if properly resourced, Station 26 (Rendon) could capture nearly 29% of all of the District's calls within 12 minutes.



This deployment strategy is well aligned with the investments

suggested for ISO coverage in areas of the highest need such as Eagle Mountain (N1b) and Whiskey Flats (N1a).

The agencies and/or locations that should receive prioritized investment strategies would be Rendon, Azle, Eagle Mountain (new location), Whiskey Flats (new location), Crowley, Briar-Reno, Haslet, and White Settlement. It is understood that some adjacent providers may provide the resources or co-locate where appropriate.

Rank	Station	Drive Time (Min)	Station Capture	Total Capture	Percent Capture
1	26	12	1,741	1,741	28.94%
2	52	12	1,058	2,799	46.53%
3	N1b	12	1,012	3,811	63.36%
4	N1a	12	637	4,448	73.95%
5	254	12	367	4,815	80.05%
6	33	12	318	5,133	85.34%
7	28	12	252	5,385	89.53%
8	18	12	197	5,582	92.80%
9	10	12	109	5,691	94.61%
10	31	12	23	5,714	95.00%
11	N1c	12	17	5,731	95.28%
12	35	12	15	5,746	95.53%
13	53	12	7	5,753	95.64%
14	49	12	6	5,759	95.74%
15	411	12	2	5,761	95.78%
16	24	12	1	5,762	95.79%

Recommendations

Fire service investment strategies may be prioritized by the agencies and/or locations that provide the greatest return on investment.

All current fire department funding would remain, or transition to standardized funding formula, except for current funding that is duplicative to the proposed funding.

This assumes new stations in Eagle Mountain (N1b) and Whiskey Flats (N1a). Therefore, the District would own and fund all of the capital for these locations. Secondly, it is likely that the staffing should be provided through contractual relationships and/or through direct employment of the District.

It is recommended that the District continue to contract for fire services.

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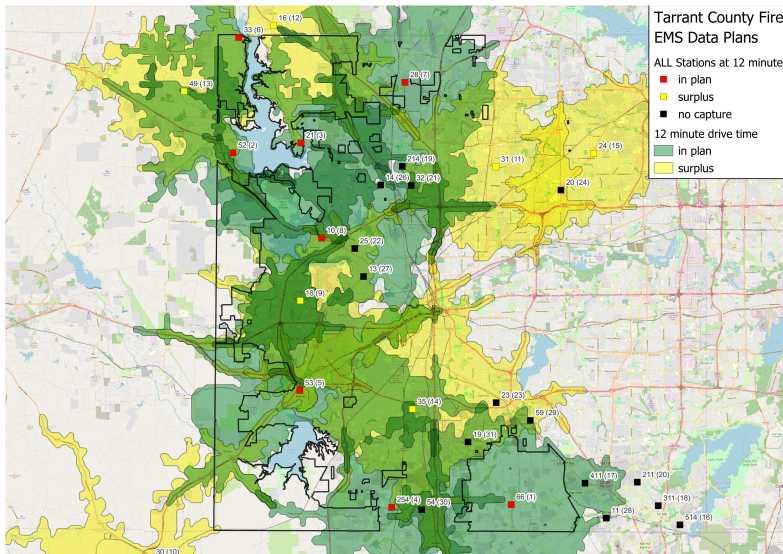
May 2025

Assessment of Current EMS Deployment

The previous fire station location study demonstrated that an 8-station configuration is well positioned to deliver a 12-minute travel time to greater than 90% of the EMS incidents. The GIS analyses utilized average road speeds, so it would not be uncommon for the fire department to outperform the modeling by several percentage points while utilizing lights and sirens responses that do not strictly adhere to non-emergency traffic behavior.

Recommendation

Within the current station configuration, eight prioritized stations can maintain a 12-minute travel time to 90% of the EMS incidents.

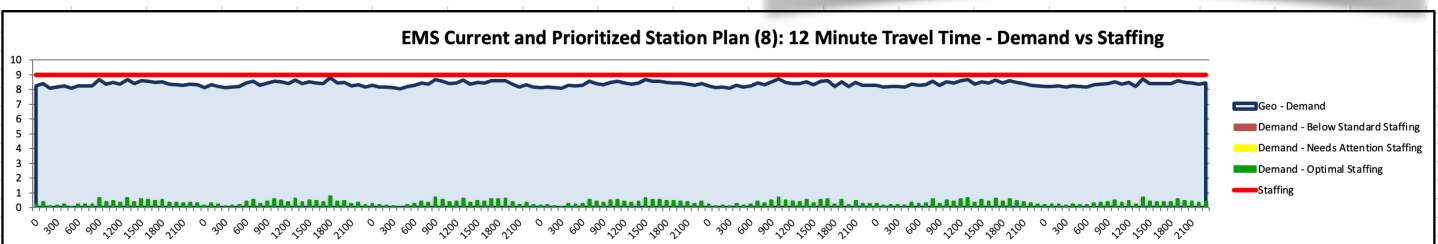
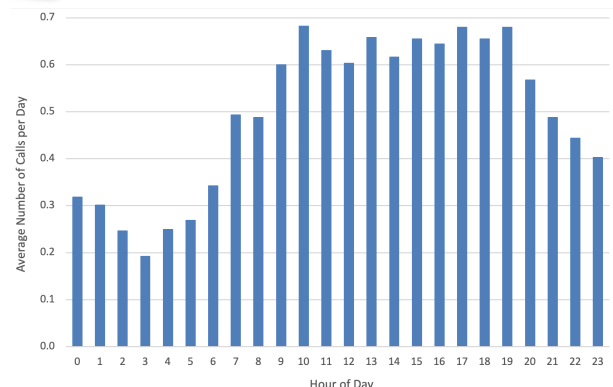


However, ESD1 is actually performing at 11.6 minutes at the 90th percentile. Therefore, maintaining current performance could be efficiently managed through eight prioritized stations.

Understanding that the average demand throughout the peak of the day is less than one call per hour, the number of EMS resources should be nine.

The following staffing-to-demand assessment considers the current staffing-to-demand to meet a 12-minute travel time and the actual call durations throughout each day of the week. The RED line indicates the deployed resource, and the BLUE line indicates the combined demand for both response time compliance and resources.

Results demonstrate that nine resources deployed from eight stations can maintain the current travel time performance.



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Considerations for Prioritizing EMS Expenditures

The following marginal utility analysis provides the District with some guidance on where the greatest return on EMS investment exists. These are provided to posit the most efficient operational design as well as guide the policy discourse on the prioritization of investments.

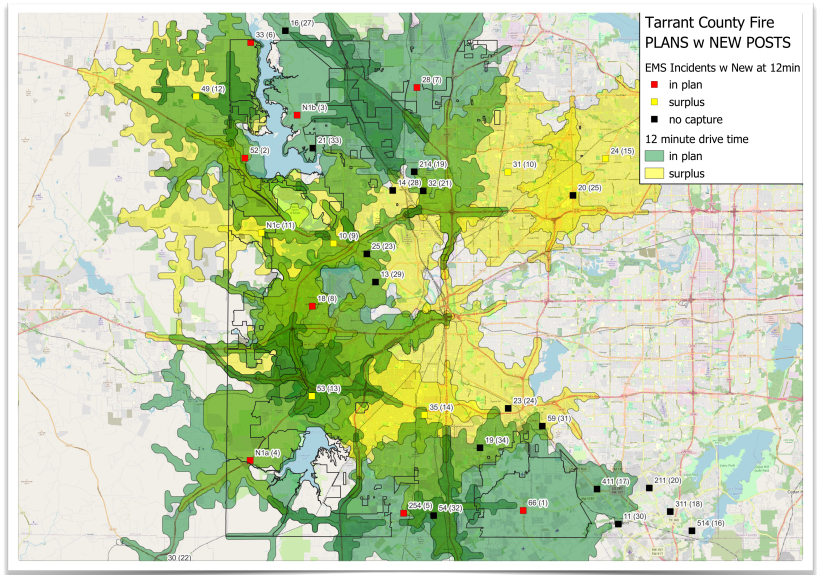
Analyses suggest that an eight station and nine ambulance configuration could maintain the current 12-minute travel time to 92% of the EMS incidents. When referring to the marginal utility analyses below, each station locations' relative contribution to accomplishing a 12-minute travel time is outlined in the last column labeled "Percent Capture". This cumulative value demonstrates that, if properly resourced, Station 26 (Rendon) could capture nearly 30% of all of the District's calls within 12 minutes.

This deployment strategy is well aligned with the investments suggested for ISO coverage in areas of the highest need such as Eagle Mountain (N1b) and Whiskey Flats (N1a).

It is recommended that two staffed ambulances are funded in Rendon, and each of the remaining territories would receive one dedicated staffed ambulance fully funded by ESD1. It is understood that some adjacent providers may provide the resources or co-locate where appropriate.

Observation

The District could fund 100% of the costs for EMS and introduce an additional revenue stream for less than or equal to the current expenditures associated with EMS.



Rank	Station	Drive Time (Min)	Station Capture	Total Capture	Percent Capture
1	26	12	1,286	1,286	29.60%
2	52	12	769	2,055	47.31%
3	N1b	12	702	2,757	63.47%
4	N1a	12	435	3,192	73.48%
5	254	12	278	3,470	79.88%
6	33	12	264	3,734	85.96%
7	28	12	142	3,876	89.23%
8	18	12	135	4,011	92.33%
9	10	12	67	4,078	93.88%
10	31	12	15	4,093	94.22%
11	N1c	12	13	4,106	94.52%
12	49	12	4	4,110	94.61%
13	53	12	4	4,114	94.71%
14	35	12	1	4,115	94.73%
15	24	12	1	4,116	94.75%
16	514	12	0	4,116	94.75%

The remaining agencies, in priority order, are Azle, Eagle Mountain (new location), Whiskey Flats (new location), Crowley, Briar-Reno, Haslet, and White Settlement.

This deployment is consistent with the "All Calls" assessment for fire stations.

The District would need to meet the agencies to validate their willingness to provide ambulance services to the District.

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Consideration for an Alternative EMS Delivery Model

The projected 2025 year end cost for EMS, identified as “Ambulance Service”, is \$2,750,000. However, the line item identified as “Aid to Departments’ Staffing” has increased by nearly \$2m in 2024 for a total of \$3,250,000. The staffing supplements were provided to Eagle Mountain Volunteer Fire (~\$726k), Rendon Volunteer Fire Department (~\$732k), and Briar-Reno Volunteer Fire Department (~\$374k).

The total costs for the provision of EMS in FY 2025/26 could be described as the combination of Ambulance Service and some of the Aid to Departments’ Staffing for a total spend of up to \$6,137,500. Therefore, there is an alternative strategy offered for the Board’s consideration; namely ESD1 funding 100% of the EMS service delivery with a dedicated workforce for EMS.

Observation

It is understood that the Board may elect to contract with adjacent providers and co-locate resources at the most efficient locations.

The system analysis demonstrates that a total of nine staffed ambulances across ESD1 would be able to deliver consistent and reliable service with a 12-minute travel time to 90% of the incidents within the District. This can be accomplished by expanding the policy approach exercised with Eagle Mountain, Rendon, and Brian-Reno in 2024 for a total cost similar to the current spend, but with enhanced operational and fiscal accountability and transparency. It is understood that some adjacent providers may provide the resources or co-locate where appropriate. The estimated costs are provided below.

Category of Spend	Personnel Costs (24/7 + Relief)	Administrative Personnel Costs	Ambulance Revenue
(9) Ambulances with 1 FF/PM and 1 FF/EMT	\$5,343,975		
Clinical Staff (Contractors)		\$150,000	
Executive Director		\$201,500	
(2) Administrative Support		\$137,500	
Total Expenses		\$5,832,975	
Ambulance User Fees (Estimated 60% transport rate and \$404 per transport)			\$1,026,806
Texas ASPP Program			TBD
Total Personnel Costs for EMS			\$4,806,169

The capital replacement costs should be included in this policy option and have been covered in the capital reserve plan. Also, the relief multiplier is at 3.15. In other words, for every seat on the daily deployment of 18 (1 FF/EMT and 1 FF/PM) for each of the nine ambulances, this would equate to a total of ~57 FTEs designed to cover the average leave of the employees. However, the relief multiplier is deliberately established relatively low at 3.15 versus 3.4 - 3.6, because within the contracted environment, the District may elect to have greater control and transparency for the need to fill vacancies and ensure that the relief dollars are being utilized for the intended purposes.

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Consideration for Future Investment Strategies

The previous analyses have introduced a methodology to prioritize limited funds to ensure the greatest return on investment for the District. The following table is a schematic of what a funding strategy could look like. This is not intended to be overly prescriptive as these decisions are complex and may have competing interests across stakeholder groups and within the unique political, operational, and fiscal environments that may exist.

Similarly, it is understood that the Board may elect to contract or fund services with adjacent providers that provide staffing and/or co-locate at the most efficient locations.

Agency/Function	Engine (3 person)	Tanker (1 person)	Ambulance (2 Person)	Recommended Spend without offset for current spending
Rendon		1	2	
		\$280,280	\$1,187,550	\$1,467,830
Azle			1	
			\$593,775	\$593,775.00
Eagle Mountain (new station)	1	1	1	
	\$1,038,960	\$280,280	\$593,775	\$1,913,015
Whiskey Flats (new station)	1	1	1	
	\$1,038,960	\$280,280	\$593,775	\$1,913,015
Crowley			1	
			\$593,775	\$593,775.00
Briar-Reno			1	
			\$593,775	\$593,775
Haslet			1	
			\$593,775	\$593,775.00
White Settlement			1	
			\$593,775	\$593,775
Total Expenditures for Prioritized Investments	2	3	9	\$8,262,735

Assumptions

All current reserve fund installments would continue.

All capital replacement obligations would continue to be met.

All current fire department funding would remain, or transition to standardized funding formula, except for current funding that is duplicative to the proposed funding.

The majority of the EMS funding would largely be eliminated. However, secondary resources could continue under the current point system when requested by the District for mutual aid or surge capacity.

District EMS resources would not be utilized for non-emergent transfers.

If the District is funding 100% of the EMS costs, then the EMS user fees would be collected by the District that provides an estimated \$1m in cost recovery.

District funded positions must be part of the minimum daily staffing and are not subject to closure without District approval.

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Consideration for Agency Fire Funding Allocation

A major tenet of this study was to identify reasonable and understandable approaches to standardizing how funds are distributed to departments in an accountable and transparent manner. This will help both the contract agencies and the District better prepare for the anticipated service demands and the available funds to provide the requested services.



Five alternative funding schema are presented for the District's consideration. As previously stated, the examples are provided to illustrate sound approaches to a standardized funding strategy,

but are not intended to be overly prescriptive and the District should retain full latitude to either adopt one of these alternatives or develop their own. The example approaches are summarized in the table to the right.

The scales for the proportion of the readiness costs are provided below. The same proportional approach was utilized irrespective of the base contract value.

Assumptions

Population estimates were created through apportioning US Census data to the GIS geographic boundaries of each agencies area of responsibility.

The GIS shape files were provided by the District and refined with the assistance of the District.

Similarly, the square mileage is provided through calculation of the GIS Shape Files provided.

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
\$100k Base + \$825 per Call	\$100k Base adjusted for readiness costs by 50/50 split between Population and Square Miles of the coverage area + \$825 per call	\$25k Base + \$1,300 per call	\$25k Base adjusted for readiness costs by 50/50 split between Population and Square Miles of the coverage area + \$1,300 per call	\$1,300 per Call with no base funding

Population Scale		Square Mileage		Factor
0	1,999	0.0	4.9	0.2
2,000	3,999	5.0	9.9	0.4
4,000	5,999	10.0	14.9	0.6
6,000	7,999	15.0	19.9	0.8
8000		20.0		1

Population and Square mileage each shared 50% of the weighted value. For example, to obtain full value of the base readiness funding, the agency would have to have at least a population of 8,000 and 20 square mile coverage area within ESD 1.

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Consideration for Agency Fire Funding Allocation

This analysis provides the detail for the funding allocation strategies to be refined and/or replicated. Each agencies current fire funding for FY 24/25 are provided for context and the reader's convenience.

In addition, the population, square mileage, and the number of "fire" calls are provided for reference. The highest investment cost are Alternatives one and three. Alternatives four and two, utilize the blended approach for distributing the base funding across the relative need for readiness.

Finally, Alternative 5 does not utilize a readiness assumption or a base contract value. Rather, this alternative utilizes a cost per call value of \$1,300 per call.

Overall, the total spend on each of the alternatives vary between \$2.5m and \$3.5m while the current spend is \$2.6m.

It is understood that the Board may elect to contract or fund services with adjacent providers that provide staffing and/or co-locate at the most efficient locations.

Assumptions

Fire calls are defined as fire related activity plus all non-EMS incidents such as hazmat and rescue.

The number of fire calls were transferred directly from the District budget.

The number of calls for any given agency may vary in the future as additional resources are staffed and deployed throughout the District.

ESD 1 Agency	Current FIRE Funding (FY 24/25)	Population	Square Miles of ESD 1 Area	Fire Calls by Budget	Alt #1: \$100k Base + Calls (\$825/call)	Alt #2: Readiness (pop/sq mi) (\$100k base) + Calls (#825/call)	Alt. #3: \$25k Base + Calls (\$1,300/call)	Alt #4 Readiness (pop/sq mi) (\$25k base + Calls (\$1,300/call)	Alt #5: Calls (\$1,300/call)
Azle*	\$212,200	3,387	7	254	\$309,550	\$249,550	\$355,200	\$340,200	\$330,200
Benbrook	\$212,000	4,595	24	193	\$259,225	\$199,225	\$275,900	\$260,900	\$250,900
Briar-Reno*	\$168,000	2,446	7	182	\$250,150	\$190,150	\$261,600	\$246,600	\$236,600
Colleyville	\$16,320	12	0		\$100,000	\$40,000	\$25,000	\$10,000	\$0
Cresson	\$118,100	2,273	16	129	\$206,425	\$146,425	\$192,700	\$177,700	\$167,700
Crowley*	\$212,200	4,804	17	225	\$285,625	\$225,625	\$317,500	\$302,500	\$292,500
Eagle Mountain*	\$312,000	3,657	25	288	\$337,600	\$277,600	\$399,400	\$384,400	\$374,400
Everman	\$166,600	941	6	103	\$184,975	\$124,975	\$158,900	\$143,900	\$133,900
Haslet*	\$212,200	5,115	10	176	\$245,200	\$185,200	\$253,800	\$238,800	\$228,800
Kennedale	\$88,000	338	1	65	\$153,625	\$93,625	\$109,500	\$94,500	\$84,500
Lake Worth	\$166,600	2,985	5	125	\$203,125	\$143,125	\$187,500	\$172,500	\$162,500
Mansfield	\$0				\$100,000	\$40,000	\$25,000	\$10,000	\$0
Newark	\$72,980	693	3	63	\$151,975	\$91,975	\$106,900	\$91,900	\$81,900
Rendon*	\$312,000	16,084	26	584	\$581,800	\$521,800	\$784,200	\$769,200	\$759,200
Roanoke	\$119,300	146	1	9	\$107,425	\$47,425	\$36,700	\$21,700	\$11,700
Saginaw	\$166,600	2,786	3	82	\$167,650	\$107,650	\$131,600	\$116,600	\$106,600
White Settlement*	\$75,500	1,231	11	59	\$148,675	\$88,675	\$101,700	\$86,700	\$76,700
All ESD 1	\$2,630,600	51,491	162	2,537	3,793,025	2,773,025	3,723,100	3,468,100	3,298,100
Less Eagle Mountain					\$3,455,425	\$2,495,425	\$3,323,700	\$3,083,700	\$2,923,700

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Estimated “All In” Net Impact for Personnel Costs

Continuing from the previous analyses, this table represents an “All In” net personnel costs for the substantive areas of investment presented in this report. This funding is both crucial to the future of ESD 1 and the citizens served, but also somewhat constrained to ensure that estimates are actualized before future investment decisions. Once again, this is not intended to be overly prescriptive as these decisions are complex and may have competing interests across stakeholder groups and within the unique political, operational, and fiscal environments that may exist.

Assumptions

All current reserve fund installments would continue.

All capital replacement obligations would continue to be met.

Standardized funding schema are presented and the highest cost alternative was utilized for a conservative estimate of net costs.

If the District is funding 100% of the EMS costs, then the EMS user fees would be collected by District.

EMS cost recovery was estimated at a 60% transport rate and a \$404 collection per trip based on regional experience.

Current costs were reallocated when duplicative.

Residual costs remained for 33% of the Aid to Fire Departments and 20% of the current EMS costs.

The overall net margin would allow the District to absorb cash flow delays after initiating EMS billing.

It is assumed that there would be a multi-year implementation.

Category	Cost / (Reduction)
EMS Program with Executive Director, Administrative Personnel, and Clinical Positions	\$5,832,975
Less Estimated Transport Revenue	(\$1,026,806)
Subtotal of Admin/EMS Expenditures	\$4,806,169
New Fire Costs (Staffed Fire Engines in Eagle Lake and Whiskey Flats plus 3 Staffed Tankers)	\$2,918,760
New Fire Funding Formula (Utilized the Highest Value in Alt #1 without Eagle Mountain)	\$3,455,425
Subtotal of Expenditures	\$11,180,354
Reallocation of Existing Expenditures	
Fire	(\$2,518,551)
Aid to Fire Departments (66% reduction)	(\$2,145,000)
Admin Costs	(\$270,250)
EMS (80% reduction)	(\$2,310,000)
Expenditures Less Reallocated Costs	\$3,936,553
Residual Costs not Reallocated	\$1,650,000
Net Costs for Prioritized Opportunities	\$5,586,553



Recommended Implementation Strategies

The alternatives provided within this report require some operational adjustments and considerations to ensure the efficacy of the performance and financial estimates. This section will provide a high-level framing of the policy considerations and assumptions contained within the alternatives.

Call Triage

It was recommended that the District begin funding and operating 100% of the EMS services through contractual relationships. Understanding that there would be eight primary locations for EMS units, these units may be traversing through other response areas. Since the District may be responsible for per call reimbursement, it is imperative that the dispatch center is able to provide a comprehensive call triage process, such as Medical Priority Dispatch (MPDS) to discern when a closest unit response is of import and not allow agencies to respond to incidents outside of the response matrix developed by the District with an expectation for compensation.

Closest Unit Dispatching or Redefining Response Zones

Continuing with the system design identified above, moving the Eagle Mountain station and introducing a new station in the Whiskey Flats area will cause some of the response zones to adjust accordingly. For example, if the District is paying for a full time resource in Whiskey Flats, then adjacent agencies' zones may be reduced as well as the requests for services and ultimately the per call compensation. The District will have to redefine the response areas and expectations in conjunction with future performance-based contracts.

Dedicated EMS Units - Monitor the Impact of Cross-Staffing

The intent of funding 100% of the EMS program assumes that the resources are dedicated and not subject to cross-staffing fire apparatus. However, at the current call volume the system would require approximately a 6% UHU value for both Fire and EMS, suggesting that cross-staffing may be an efficient utilization of career staff. Therefore, the District should carefully monitor the performance of the EMS system and restrict cross-staffing activities as needed to ensure the proper return on investment. If needed, the call triage process can reduce the types and number of fire related activity involving EMS units and/or personnel to high-risk events such as structure fires and reduce utilization for lower risk events such as fire alarms.

Fitch's recommendation is that resources should not be cross staffed after approximately 1,500 calls and a call concurrency of 15%. Finally, District funded EMS units should not be utilized for non-emergent transfers.

Recommendations

Develop an agreed upon call triage process and response matrix to ensure the best utilization of limited resources and control costs.

Redefine response zones for Fire and EMS after the introduction of new stations and the reconfiguration of the EMS system.

District EMS resources should not be utilized for non-emergent transfers.

The District should approve any cross-staffing between EMS and Fire responsibilities and ensure EMS performance is meeting expectations.

Cross-staffing should not be continued after 1,500 calls per year and a 15% or higher call-concurrency rate.



Recommended Implementation Strategies (Cont.)

EMS Move-Up

Part of the efficient utilization of the nine ambulances is that during surges in EMS demand, resources may be moved up to locations that provide the most efficient coverage within ESD 1. Therefore, any over reliance on cross-staffing fire responsibilities may be impacted when an ESD 1 EMS unit is relocated during peak activity. Conversely, an agency should not move-up a cross-staffed fire resource that removes the EMS coverage without the Districts consent.

EMS Billing

In conjunction with the EMS funding strategy, the District will need to establish itself as a provider and make the appropriate registrations to be able to assume the billing functions. It should be expected that there will be a lag in accounts receivable for approximately 6-months until the recurring revenue is consistent and on-target for the annualized value.

District Funded Positions as Daily Minimum Staffing

District funded positions should be part of the daily minimum staffing of the provider agencies. Therefore, District positions should not be subject to closure, out of service times, or brown-outs without District approval.

Staffed Tanker Coverage

One of the recommendations is to begin staffing tankers with one FF/EMT 24/7 to assist with a more efficient dedication to providing mobile continuous water supply to help with the ISO ratings and insurance availability and costs. The initial proposed investment was in Rendon, Eagle Mountain, and Whiskey Flats.

However, the financial analyses demonstrate the District will still have limited capacity to fund all issues and may have to prioritize funding. For example, for the same cost of providing three tankers, the District could fund a 3rd full time engine company. This may be relevant if the District needs to assume responsibility in any prioritized areas or open new stations in uncovered areas similar to Eagle Mountain and Whiskey Flats.

Dispatching and Data Capabilities

The District's future is tied to a more robust and efficient call triage and dispatching process as well as sufficient access to timely and detailed data.

The system design and recommendations will be limited if the data and process are not in place to allow the system to function with the utmost efficiency. The District will need timely access to data sufficient to support professional management of the system resources and performance. Additionally, it will be a necessary tool to partner with contracted agencies to have a transparent and accountable dialogue for contract performance and equitable funding.

Recommendations

District funded EMS units are subject to periodic move-ups to more efficient locations during surges in demand.

The District should expect that once the official registration processes are in place, a 6-month lag in revenue should be expected and accounted for in budget decisions.

District funded positions must be part of the minimum daily staffing of contracted agencies and are not subject to closure without District approval.

Tanker Coverage may have to be reconsidered if additional fully staffed engine companies are required.

The District should ensure that the capabilities of dispatching, call triage, and data management meet the expectations of the system design.

Volunteer Recruitment and Retention

Overall, the national experience is that volunteerism is on the decline in the United States. There are many factors that may contribute to this phenomenon, including a changing economy, generational preferences, and community age demographics, to name a few.



U.S. Fire Administration
Working for a fire-safe America

Retention and Recruitment for the Volunteer Emergency Services

FA-361 | May 2023



FEMA

In 2023, the United States Fire Administration (USFA) and the Federal Emergency Management Agency (FEMA) published an excellent guide and resource dedicated to the common challenges that are targeted specifically to volunteer agencies.

The 2023 released report titled Retention and Recruitment for the Volunteer Emergency Services (FA-361) found that from 1984 to 2020 there has been a 25% decrease in volunteer

External Dynamics

Reduction in available time to volunteer

Increase in dual-income households

Fewer businesses allowing workers to leave for call during work hours

Employees who commute further to work

Internal Dynamics

Increasing demand for service

Increasing training requirements

The overall length of the onboarding process and initial training to be a contributing member

Individual health risks

Scheduling conflicts

firefighters across the country. Some of the reasons reported externally for the recruitment and retention challenges include: reduction in available time to volunteer, more dual-income households, less businesses allowing workers to leave for fire calls during work hours, and employees who commute further to work.

Internally, some of the dynamics include: increasing demand for service, increasing training requirements, and health risks.

It is usually not just one of the challenges, but multiple, that keep residents from volunteering at their local fire department. In addition, each communities unique experience may vary. Therefore, it is recommended that the department is well versed in the best practices and guidance provided by the USFA and evaluate and implement a robust strategy for the greatest return on investment and organizational sustainability.



Continuous Improvement and Annual Appraisal

This SOC document is designed to guide the department to continuously monitor performance, seek areas for improvement, and to clearly articulate service levels and performance to the community we have the privilege of serving. Therefore, the Fire Chief has established a Compliance Team to continuously monitor elements of this SOC and make recommendations for system adjustment or improvement quarterly.

Recommendation

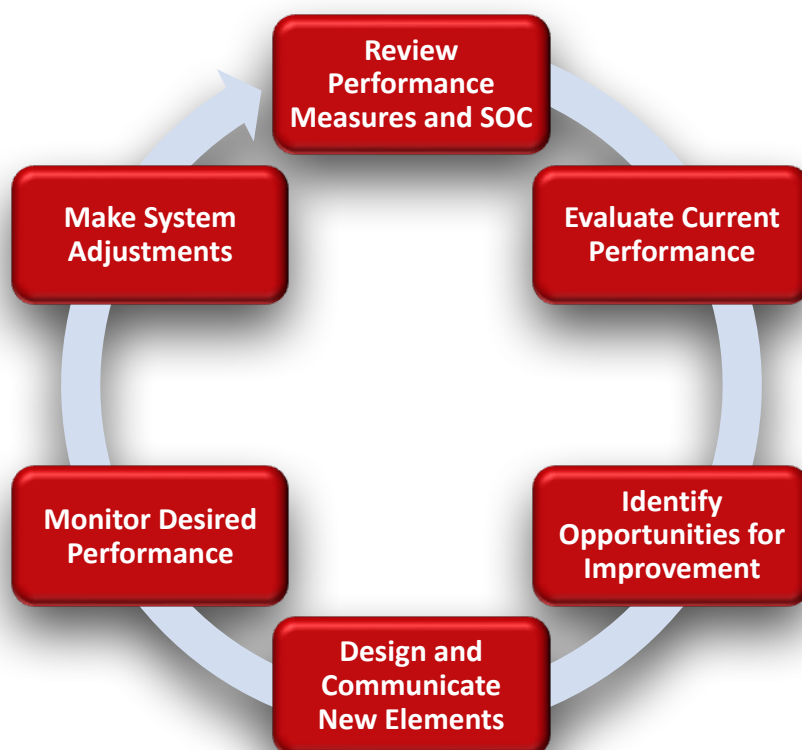
The department should regularly analyze performance data and outcome measurements to ensure alignment with strategic goals and objectives.

Compliance Team and Responsibilities

The Compliance Team will consist of the following department members (TBD) and will have the responsibility of continuously monitoring changes in risk, community service demands and department performance in each program area, fire department demand zone, and/or risk category.

- Chair - Director of ESD1
- Members - Fire Chiefs
- Member – Community Risk Reduction
- Member – Operations
- Member – Administration

Performance Evaluation and Compliance Strategy



The Compliance Team will evaluate system performance by measuring first due unit performance at the 90th percentile quarterly and annually. In addition, the department will evaluate first due performance by each individual SDZ and by program area. Annual reviews will be conducted in January of each year regarding the previous year. All response performance monitoring will exclusively evaluate emergency responses.

The Compliance Team will determine the strengths, weaknesses, opportunities, and challenges of the system performance annually and make recommendations for system adjustments to the Board. Finally, the team will annually update and evaluate the risk assessment matrices for relevancy and changes in community risk.

Appendices - Supporting Documents

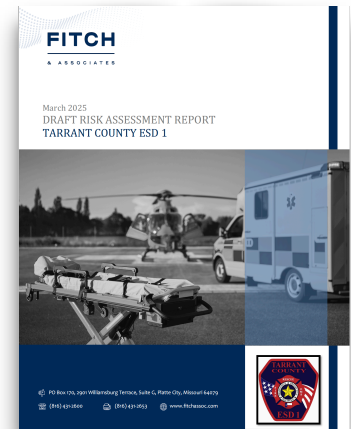
The community risk assessment (CRA) is presented as a supporting document to provide greater detail and transparency into the risk assessment process.

This summary report provided the high-level substantive results of the community risk assessment. However, if greater detail is desired, please refer to the Community Risk Assessment report provided in the appendices.



The comprehensive quantitative data analysis is presented as a supporting document to provide greater detail and transparency into the historical performance of the fire department.

This summary report provided the high-level substantive results of the comprehensive data analysis. However, if greater detail is desired, please refer to the Data Analysis report provided in the appendices.



The comprehensive geospatial analysis (GIS) is presented as a supporting document to provide greater detail and transparency into the response time and fire station location study.

This summary report provided the high-level substantive results of the comprehensive data analysis. However, if greater detail is desired, please refer to the GIS Analysis report provided in the appendices.



The comprehensive financial assessment is presented as a supporting document to provide greater detail and transparency into the financial recommendations provided in the summary report.

This summary report provided the high-level substantive results of the financial analysis. However, if greater detail is desired, please refer to the Financial Analysis report provided in the appendices.

